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★HOMES OF FAMOUS FOODS

The plant at which is made one of the best known of the nationally advertised food products is shown on the cover. It is the factory of Jell-O Co., Inc., at Le Roy, N. Y. This is a General Foods subsidiary.

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This Issue

ADVICE FROM THE F.B.I.

J. Edgar Hoover, known to all kids as the head G-man, has a word to say to all industry through the pages of magazines belonging to the trade association known as Associated Business Papers, Inc. Not many food manufacturers have received defense contracts yet. But if war comes, the saboteurs hit wherever they can. In 1917 even a lowly sauerkraut factory was not beyond their attention and was burned to the ground. The remains of an incendiary bomb was the telltale evidence. Mr. Hoover's message is on page 39.

OLD FRIEND TO THE RESCUE

Pectin is an old friend of the food industry and of food consumers. Without it there would be none of those delicious jams, jellies and preserves. And now pectin promises to solve a technological problem in the relatively new freezing industry. That problem is the loss of juice from frozen strawberries and peaches when these fruits thaw for consumption. Page 55.

MARKET, MONEY AND SHIPS

The "little democracies" of war-ravaged Europe want food from the Americas—about 6,000,000 tons of it. The money, free gold, is available to pay for it. Ships can be had to transport it. But as yet Churchill doesn't see fit to let shipments go through. And you can't blame Britain for doing what she believes necessary to win the war. However, the market is there—will be there for a long time to come. Eventually food may be shipped, and what this tremendous market will mean then is told by E. O. Heyl, recently Special American Representative in the Balkans for the Commission on Polish Relief. Page 37.

WHERE SAMENESS PAYS

In spite of all current cries against threatened regimentation, in some cases it pays to have things forcibly kept just alike. One instance is in the flavor of a food product, consumer demand being largely built upon pleasing flavor, dependably maintained. To reach this goal requires rigid, exact control over ingredients. How one beverage plant has established and maintained such control will be suggestive to food manufacturers in other lines. See page 52 for the story.

A SPICY STORY

One of the first effects of the European war was to interfere with normal trade in spices. New York has become the pepper mart of the world. Plans are under way to carry large stocks of other spices in this country. And exhaustive search goes on to develop sources of supply that are free from war interference. Read what important factors in the spice trade say about this situation, beginning on page 44.

Coming

IF THE WORST COMES

Perhaps there is no cause for worry about tin supplies, what with reserves stocks being built up and with arrangements for Bolivian tin. Yet anything can, and does, happen in these turbulent times. So 'tis well to be prepared for the worst. The "worst" has already hit European countries, so America can profit by considering the steps that have been taken to meet the shortage of tin. These steps will be discussed in an early issue.

TRENDS OF THE TIMES

Things are happening which will affect the packaging, distribution and sale of foods. With the defense boom comes the feeding of more people in industrial and commercial restaurants. Also with defense preparations comes the feeding of more men in Army mess halls. All of which means that more food will be bought from manufacturers in the large, institutional-size containers. Nor is that all. Changes will be needed in manufacturers' distribution and sales methods. The significance of these trends will be interpreted in the February issue.

MORE SEA LANES BLOCKED

Not only are spice supplies made uncertain by the war's interference with sea-borne traffic, but many customary sources of flavors and essential oils are either threatened or blocked. Fortunately, however, many of the most important of these are, or can be, produced in the United States. And many others can be obtained from Central and South America. How flavoring supplies stand today will be told in FOOD INDUSTRIES for February.

RAIN FALLS—SNOW MELTS

Noah built himself an ark because he had advance information that the flood would come. We also have advance information that floods are likely in every river valley, any year, from January to April. Knowing this, the wise food manufacturer, whose plant is situated where floods may rise, prepares for the emergency. And in case he does not know exactly what to do, he should read the article in the February FOOD INDUSTRIES by one who went through the 1937 flood in the Ohio Valley.

FOLLOW THROUGH

Close control of raw materials is not enough to assure a quality product that is always the same. Every step in the manufacture and subsequent handling must be watched like a cat watches a mouse. Otherwise, something may cause a slight flavor change, or contamination may occur. How such control can be maintained is well illustrated by a modern beverage plant. This month FOOD INDUSTRIES tells how such a plant controls its ingredients. Next month the follow through in the manufacturing process will be discussed.

FOOD INDUSTRIES
PROCESSING • DISTRIBUTION
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LAURENCE V. BURTON, Editor
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The Talk of the Industry

★ If Food Industries appears a little different to you than heretofore it is because it is now being set in a different type face, Bodoni Book, with ample space between the lines. The change was made solely in the interest of greater legibility and easy reading.

Whether you like it or not, the editors would be glad to learn of your reaction to the change.

★ Ice cream and cheese are processed foods in the technological sense, for they do not grow or accidentally happen. Yet a recent resolution at the conventions of the dairy industries seems to regard them as natural foods.

Don't smile when you read that. The dairy people are sufficiently powerful in the political sense to force Congress to adopt such a concept by a substantial majority if they really want it. Butter, as you may recall, is the only food defined by law. All others are defined

by regulations. Butter may be artificially colored without label declaration. No other food enjoys such immunity. Ice cream and cheese may yet become natural foods by an act of Congress.

★ Among the constantly increasing list of new uses of refrigeration is that of freezing peanuts before pressing to remove the peanut oil. As a result of such freezing the oil comes out much more easily, according to a recent report to the American Society of Refrigerating Engineers.

Apparently low-temperature technology of foods is just beginning to be understood.

★ One index of food costs that has long been ignored by the world at large is the ration allowance for the military forces of the United States. For instance, in 1940 the U.S. Navy ration averaged 46.586 cents per man per day, which compares with 47.584 cents in 1939. But the Navy expects higher prices in 1941.

★ Current wholesale prices for 92 score butter at slightly over 34 cents per pound (New York) are about 4 cents higher than prices at corresponding dates a year ago. In peace times this price would bring in a considerable quantity of imported butter, largely Danish, over the U.S. tariff wall of 14 cents per pound.

Butter prices, always an interesting subject, have a broad meaning as an index of national prosperity. Being a semiperishable commodity, butter cannot be held very long. Hence current prices always reflect the ability of people to buy it. But an equally important aspect is that current price fluctuations reach back to the farmer in about four days.

City populations which lament the high retail price of butter should realize that higher prices mean more farm purchases of manufactured goods and therefore more employment for urban producers. This relationship is generally true until the retail price goes high enough to curtail consumption.

★ A friend just returned from a business trip to Japan reports that instead of the usual presents to heads of corporations with whom he does business (a Japanese custom) he presented each with a ten-pound sack of sugar that he had

picked up en route at Honolulu. Inasmuch as all persons in the Japanese homeland must subsist on a very restricted ration that includes only two ounces of sugar per month, a donation of ten pounds of sugar was the equivalent of a royal gift to be received with much bowing and peculiar Japanese sounds. It's bombs instead of sugar in Japan.

Another recently repatriated American reports that the Japanese civil population are literally starving themselves in order to feed the army. He became so emaciated on the civil ration that he needed assistance in walking up the gangplank of the steamship on which he departed.

So sorry.

★ This business of keeping track of what is really going on in the nation is rapidly reducing this department to a state of hopeless cynicism. Not long ago

two different persons who ought to know what they were talking about confided that the tin situation had everybody worried, for there wasn't a chance that we would ever build up an adequate reserve of tin. The reason given was that, under the 100-percent excess profits tax in Great Britain, nobody was bestirring himself in the Federated Malay States. For what purpose would anyone exert himself when all additional profits go to the government and tin ore reserves are reduced at the same time? (Evidently the profit motive holds in the Far East.)

Yet despite their dire forebodings, on the very next day somebody else who was in no better position to know the facts, though cloaked with more authority, put out a public statement that everything was satisfactory and more than a year's stock of tin was now on hand.

Where does the truth lie?

Dr. Herbert A. Baker

THE DWINDLING LIST of pioneer scientists who have contributed much toward the establishment of the food industry on a sound technological basis was again reduced in November by the death of Dr. Herbert A. Baker. Though he was president of American Can Co. in his latter years, his contribution to the art of preservation of foods was both that of a scientist and an executive who understood perfectly the function of research and encouraged it continuously.

To all young food technologists, the career of Dr. Baker should be a stimulus to aspire for great achievement. His rise was not meteoric. If he possessed any unusual personal qualifications it was his remarkable memory and unhurried, surefooted logic which served him admirably in decisive moments. Though quite different from the popular concept of a salesman, this chemist from the laboratory made good in a succession of sales jobs, ultimately reaching the top job in a large company.

As seen from the outside, his success was due not so much to his technical knowledge of his own business as to his knowledge of the intricacies of the problems of the food manufacturer to whom his company sold containers. A deep and profound thinker in the industrial sense where ideas and plans are the basis of successful business strategy, he was the counterpart of General Forrest, who believed in getting there "fustest and mostest."

The Uncertain Outlook

ONE of the few things we have ever looked back upon with any degree of satisfaction in this vale of tears has been our refusal to make any predictions as to the future of events in the food industries in 1940. To satisfy what is euphemistically called popular demand, it was necessary to put out a year-end statement that we would make no statement. Apparently the novelty of a statement of refusal to do any crystal gazing was so great that newspapers quoted it extensively.

In 1940 Denmark, Norway, Holland, Belgium, France, Luxemburg and Rumania have been invaded and, as far as current events are concerned, are temporarily a part of Germany, blockaded and out of business as far as world trade is concerned. In the same restricted situation are found Sweden, Estonia, Latvia, Lithuania and Italy. Spain is out of the running until it agrees to stay out of Axis entanglements. And Great Britain is not buying food to any noticeable extent from the United States.

Our export trade in foods is very small at the close of the year.

Compared to 1939 earnings, a part of the poorer showing made by many food companies is due to the loss of exports, while another part is due to losses either sustained or anticipated by European branches and subsidiaries. Increases in costs of raw material, notably cereals, that could not be offset in 1940 by higher selling prices, account for other poorer showings.

Biggest uncertainties ahead, as far as food manufacturing profits are concerned, are the weather and the questionable possibility of sale of foods to

Hors d'Oeuvres

★ "If you want to be a good mother . . . B_1." So advises San Joaquin Baking Co. in advertising its fortified bread. And to be a successful baker you may have to B_1, too.

★ *Notes left in milk bottles sometimes contain surprising information. Take, for instance, this one, scrawled in a masculine hand and left for a Borden milkman: "Please do not leave any milk for about ten days, and then start leaving eight or nine quarts a day—or whatever a baby needs."*

★ In Bridgeport, Conn., factory workers are drinking 300 percent more champagne since the defense boom started. In 1918 they bought expensive clothes. This time they're keeping warm from the inside.

★ *Army regulations prohibit the sale of intoxicating liquor on military posts. But beverages containing 3.2 percent alcohol are not intoxicating. So the boys will drink beer to the General's health. Or will they?*

★ The torpedo fish conquers its prey by generating a powerful electrical shock which paralyzes its victim. The fish has a pair of potent batteries on either side of its head, these consisting of a series of gelatinous plates separated by membranous vessels containing a salt solution. Who was that fellow Edison?

★ *Foodland, Inc., subsidiary of Clover Farm Stores, has brought out a new canned pork product, "Squeel." So even that isn't lost any more.*

★ Referring to radio promotion, the Wisconsin State Department of Agriculture says the airlanes are full of cheese these days. And so are the airplanes, if you believe Mr. Ingersoll.

★ *The president of a Chicago bank, believing that government policies have wrecked investment opportunities, has urged depositors to take their savings and bury them in tin cans. . . Canned bullion.*

★ To boost out-of-state sales of cheese Wisconsin has adopted the slogan: "Cheese is mailable—we know." Maybe, but every package of Limburger ought to carry a gas mask for the postman.

★ *National Cherry Week will be held February 15-22, the week ending on Washington's birthday. . . . Mystery: Why should the cherry industry celebrate a man with a reputation for destroying cherries?*

★ Aristotle described honey as "dew distilled from the stars and the rainbow." What a hell of a food technologist he must have been.

★ *We propose that the dunking symbol (hand, doughnut and cup) be made a national emblem. Nothing epitomizes the spirit of a democracy better than dunking—the taking of a harmless liberty whenever, wherever and by whomever the desire dictates. Dunk to democracy!*

★ The Chinese tie a line to the tail of the remora, a fish with a suction disk on its head, and toss it into the water near a turtle. The fish darts to the turtle and attaches iself to it. Then the Chinese haul in the fish and the turtle. Either the Chinese are very clever or the remora is awfully dumb.

★ *With candy companies distributing products named after comic-strip characters, it's getting so you can't tell which end of the stick the sucker is on.*

F. K. L.

conquered European nations with British permission and dubious German guarantees of noninterference. The only certainty for 1941 is that as long as defense spending holds its present rate, the buying power of the consuming public will increase, which in turn can be expected to result in higher prices and greater demand for so-called luxury items.

Mobilization of troops will be another factor to be considered, for the Army eats differently from civilians, slight increases being found in meats, butter, cereal products and vegetables, while small decreases will be noticeable in the consumption of milk, cheese and fruits. The larger the Army, the greater the shifts in demand, but who knows how big the Army is to be?

Important to specialty food manufacturers and distributors in munitions producing areas is the sudden growth of industrial cafeterias and portable lunch service units inside of plants. This striking trend has come into being partly as a convenience to employees, partly to avoid the possibility of "strangers" slipping in unnoticed during the noon time exodus and return as an antisabotage or antiespoinage precaution, and partly to reduce wasted production time.

But as to the future progress of the war, its effects on U.S. affairs, or whether or not the United States will go to war with Japan in 1941, we are not sticking our neck out, despite the fact that such factors will be very important in their results on our domestic food industry.

Problems of Deferred Occupational Status

EMPLOYERS of men of draft age face problems not heretofore encountered. The tendency will be to ask for deferred occupational classification for important or key employees. If granted, the deferment will be for only six months. In theory the employer is granted six months' time in which to find someone else to replace the deferred man. While it is theoretically possible to secure additional occupational deferments, the problem will recur every half year until the registered man is 41—not 36 as many erroneously believe.

Employers should plan to replace men (temporarily) who are in the deferred occupational classification when they are next called, but if the replacement is a man who already has an occupational deferment classification, and is hired away from another concern, he automatically loses his deferred status. For the occupational deferment applies to the man, not to his job. There are no jobs that have deferred occupational status—only the man can have it.

Never ask for deferred status for a man until he has received his questionnaire indicating that he is about to be classified.

Men who are employed to replace drafted men must thoroughly understand that they are temporary employees, for the law requires reemployment after the military service is over.

A New Competitor for Excess Profits

BUSINESSMEN must not overlook the fact that large labor unions are headed by very astute and well-informed executives who themselves are economists or are importantly advised by able economists and engineers. For example, John L. Lewis in his capacity as head of United Mine Workers of America long employed on his staff Dr. Walter Polakoff, a well known engineer and economist. And Philip Murray, new president of C.I.O., is reputed to be a first class economist as well as executive, orator, labor negotiator and organizer.

Looking at the current business boom arising from the defense program, the labor leader's approach is much like the business man's approach except that, unlike business, labor has no legal restrictions on its price increases. Nor does labor face a problem like the Federal income tax problem of business where the government will get the lion's share of excess profits. Labor is quite unhampered. Labor leaders realize all too well that business profits, once absorbed by the government via the income tax route, cannot be used to pay wage increases in the businesses from which they were derived. So the tendency today is a noticeable effort by organized labor to beat the government to the profits—if any. Many of the recent wage demands and those of the near future can be explained on the foregoing basis.

Under existing laws there is nothing to be done to prevent this contest between labor and the U. S. Treasury to capture a big whack of the profits. Business, industry in particular, often stands in the unhappy position of being forced to pay out the cash one way or the other, and yet keep on producing the goods that are so urgently needed for national defense.

It can be taken for granted that no huge profits can be retained for the benefit of the owners of business as occurred in World War I. Profits there will be, of course, but under the conditions of today the profits will go largely either to government or to organized labor. It all depends on who gets them first. And business executives will be wise if they recognize this new competition for what it is, and shape their business policies accordingly.

Enormous Opportunity To Sell Food

E. O. HEYL tells us in this issue of the needs of starving conquered nations. Last summer he was actively engaged in the Polish feeding activity and knows from personal experience how the system works. The plan is to try it out, cautiously to be sure, with the other nations, beginning with Belgium.

This plan is not a plea for charity. The money and ships are available. Also the organization headed by Herbert Hoover is ready to administer the relief plan. All that is needed is Great Britain's consent to pass this enormous quantity of food through the blockade and, equally important, Germany's agreement to keep hands off.

Should Britain permit the operation of this plan, the quantity to be purchased will amount to roughly one twentieth of the total annual consumption of the United States! Part of it will be taken from South American countries, which is as it should be, for anything that will relieve them from their economic distress will do more to cement Western Hemisphere friendship and solidarity than all our protestations of national friendship. If the lion's share of the food orders were to go to South America, it would be a distinct blow to Nazi influence below the equator.

While the majority of Americans would not do anything to hinder Britain, they will await the outcome of further deliberation on this proposal of Mr. Hoover with great interest. For if Britain and Germany should ever consent, the export of food stuffs will relieve pressure of agricultural surpluses.

Real Cooperation

NATIONAL CANNERS ASSOCIATION accomplished one of the smartest bits of public service and industry protection that we have heard about lately. The canners are not bragging; but they and the Army certainly both deserve compliment.

The Army, with greatly enlarged food need, began to buy its customary type of canned vegetable supply in the No. 10 tin can. Almost at once it was evident that some elements in the "trade" sought to make an extra speculative profit. Neither the Army nor NCA officials relished the thought that the Army

should pay excessively for its canned corn, canned peas and other supplies simply because of this unusual new demand.

The Quartermaster Corps and the Association technical staff worked out a schedule by which purchasing officers would accept either the No. 10 tin or No. 2 or No. 2½ sizes. The Association provided a simple table so that bids on various sorts of vegetables could readily be compared as to cost per pound of net content. The Quartermaster General authorized the purchasing offices to buy in accordance with this plan.

As the Army demands develop in other food fields there may be comparable problems. It is to be hoped that in each of these there will be equally clever spreading of the demand over the supply of goods in the market as a whole. Thus the reputation of other divisions of industry can be protected against the charge of profiteering and the Army can get what it needs at a reasonable price.

Though the general belief is that speculators are responsible for the remarkable disappearance of institutional size (No. 10 containers), it should be borne in mind that there has occurred a very recent enormous expansion of industrial cafeterias which also are a market for No. 10's. One munitions plant has recently made a third enlargement of its cafeteria, the latest addition covering 25,000 sq.ft.

If institutional demand is the correct explanation, all well and good; but if the speculator is the culprit, there will be no sorrow elsewhere.

Now It's Vitamin B_2, B_6, Calcium and Iron

GOVERNMENT HEARINGS on proposed standards of identity for certain foods, wheat flours in particular, have brought into prominence some significant sidelights on what constitutes a food.

Emphasis was placed on these sidelights by Dr. W. H. Sebrell, head of National Health Institute, in his talk to the recent St. Louis meeting of Millers' National Federation. Heretofore, vitamin B_1 deficiency in the human dietary has been highlighted. Even a finger of suspicion has been pointed at the miller of white flour and the baker of white bread as contributing to that deficiency. Also, recommendations have been made that the vitamin B_1 content of wheat, lost during milling, be restored to the flour by the addition of thiamin.

Mere restoration of vitamin B_1, even of the lost calcium, to white flour and bread is no longer regarded as sufficient in the interest of improved national health, say eminent nutritionists and medicos, including Dr. Sebrell. They claim that actual and symptomatic vitamin B_1 and calcium deficiencies are most generally accompanied by deficiencies of vitamin B_2, antipellagra vitamin (B_6) and iron.

To remedy this reported clinical condition of national health, food manufacturers (flour millers now, and probably bakers, confectionery, breakfast cereal, and sugar makers later) are being encouraged to fortify their products with not only thiamin (vitamin B_1) and calcium but also with riboflavin (vitamin B_2), nicotinic acid (vitamin B_6) and iron.

While Miss Harriet Elliott of the Consumer Division of the National Defense Advisory Commission has been quoted as urging the fortification of foods as a national defense move, Dr. Sebrell openly states that his interest in the proposal is more far reaching than merely as a military measure. He regards it a part of an all-time public health program.

Whatever their products, all food manufacturers will do well to follow future Federal hearings on standards of identity and to read carefully the rulings of the Food and Drug Administration in respect to flour and baked products.

New Opportunities For Food Technologists

DECISIONS or governmental rulings involving the fortification of foods with nutritional accessories mean problems and headaches to production executives.

First of all there is the problem of obtaining supplies of the necessary constituents from dependable sources at a price that is neither prohibitive nor speculative. In a recent conversation, we were told by one producer of vitamin B_1 fortified foods that his company had taken an overnight loss of $4,000 on its inventory because of a decrease in the market price of the vitamin alone. Flour millers have put riboflavin, nicotinic acid and iron on the optional list of constituents of the proposed "Vimin" flour because of their scarcity, high market price and uncertainty of the form in which they, especially the iron, should be added.

Secondly, there is the problem of homogeneously and uniformly mixing the very small percentages of these potent materials into products such as flour on a large-scale production basis. Twenty thousand pounds of white flour may receive the necessary 1-1/9 oz. of thiamin, but that simple fact does not guarantee that each 24-lb. family-size bag or each 140-lb. bakery-size bag contains its pro rata share of that 1-1/9 oz. of thiamin without controlled and adequate mixing.

Thirdly, there is the problem of knowing how much of these nutritional accessories should be added to each lot or run of a finished product, flour for instance, to bring its total vitamin or mineral content up to the required minimum to meet label declaration or legal requirements. Raw materials, wheats in the case of flour, vary widely in their natural vitamin and mineral content. Semifinished products made from them will vary even more widely, depending upon the method of processing used or degree of refinement attained. To add more than the required amount of the vitamins is to court needless or disastrous expense. To add less is to flirt with a heavy fine, a prison sentence, or both.

None of these obstacles is insurmountable. But they can not be overcome by rule-of-thumb or by-guess-and-by-gosh methods. Their solution requires application of the highest type of food technology.

On the one hand, the solutions of these problems will be sought by the maker of the vitamins and minerals as a part of his technical services to his actual and potential customers. His solutions will involve a large, economical and stable-priced supply of the materials. They are also likely to involve the preparation of pre-mixes of standardized potency which may be easily and uniformly mixed with the customers' finished products. This latter service will be particularly valuable to and desired by the small mill or plant owner who cannot afford to pay the full-time salary of a capable and dependable technologist.

Operators of large plants or mills may need to add to their technical staffs men trained and skilled in vitamin technology. To some, such a step is only an expansion of a thorough quality control program already employed in their plants. Control over the vitamin and mineral content of their products will entail, at most, the possible hiring of an additional technologist and the purchase of the necessary equipment and precision instruments needed for vitamin control work.

In the case of precision instruments, rapid strides have been and are being made to make vitamin control work rapid, accurate, relatively inexpensive and adaptable to continuous large-scale production.

Verily, the day of the food technologist is still in its dawn.

Acme

Impoverished refugees waiting in line to receive a handout

Food Wanted: 6,000,000 Tons

European war refugees offer tremendous market for food industry, if shipments ever are permitted to go through. There are arguments for and against—The Editors.

By **E. O. HEYL**, *recently special American Representative in the Balkans for the Commission of Polish Relief, New York, N. Y.*

REPRESENTING the "small democracies" of Europe, there are now in America six separate special committees. They want to buy Food! Food for 37,000,000 of their countrymen who, as winter begins, face not simply hunger and want, but famine—death-dealing, devastating famine—now on the way to hundreds of thousands.

They want grain, flour, fats, milk, meats, peas, beans, rice—in enormous amounts. They have ships to carry these foods. They have the money to pay—not in frozen funds, but in free gold. They are eager to spend it—hundreds of millions of dollars—in North and South America. They ask no charity. They ask compassion and the powerful voice of American public opinion raised in their behalf.

These countries some months ago appealed to former President Herbert Hoover to organize the administration necessary to handle this matter, recognizing that they could not appeal to the American Government without creating international complications. From the experiences of the last war they knew that an independent neutral commission for whose acts no government would be responsible would have more chance of success, for it would deal directly with the governments at war without involving them with the third government.

In this war, Mr. Hoover has already sponsored and carried out a plan for partial feeding of millions of Poles in Central Poland. Their countrymen in America and Europe provided the money. They prevailed upon Mr. Hoover, out of his wide experience in this field, to set up the plan of procedure and to secure from Germany the safeguards necessary to insure safe transit and distribution without loss to those for whom it was sent.

The British government approved the plan and permitted the food to go through the blockade. The Germans signed an agreement to the plan, basic among its conditions being the stipulation that receipt and distribution of the food was to be exclusively in the hands of Americans picked by Mr. Hoover.

Some 150 carloads thus far sent under this arrangement to Central Poland from America, Lithuania and the Balkans has arrived at Warsaw and other destinations without loss or shortage. The food so sent has been distributed to needy Poles under supervision of Americans by committees of Poles appointed by Americans.

E. O. HEYL

Acme

HERBERT HOOVER

E. O. Heyl is well known to older readers through his 17 years with Libby, McNeill & Libby, where he was manager of the pickle and condiment department. In 1917 he was drafted by the Council of National Defense to be the food member of the Committee on Supplies headed by Julius Rosenwald. Later, when the Food Administration was created, headed by Herbert Hoover, he was transferred to that body and became head of the Division of Coordination of Purchase. All Allied purchases of processed foods in the United States had to be cleared by his division. In April of this year Mr. Hoover asked Mr. Heyl to make a food survey in the Balkan states in the interest of the Commission on Polish Relief. Mr. Heyl returned in early September.

Hoover Makes Appeal

Out of this gratifyingly successful operation and his experience in the last war, Mr. Hoover appealed to the British government for cooperation in a proposed program for feeding 37,000,000 famine-facing friends of Britain in these little democracies—Finland, Belgium, Holland, Denmark, Norway. Because of the fear that such feeding might help the Germans or harm the British, the proposal was for a trial of the plan through modest initial shipments to Belgium. *If the Germans "touched" such shipments or removed any other domestic foods from Belgium, the entire program would terminate.* Because the impending results of famine are so far-reaching and frightful, it was urged that the proposed plan be given a fair trial. Consecutive shipments would prevent risking any great amounts at any one time.

Those of us who are old enough may recall the ravages in this country and throughout the world of virulent influenza in 1917-18. This death-dealing disease, as well as typhus, which knows no geographical boundaries, started in the cesspools of human misery in southeastern Europe, where famine raged and hundreds of thousands died like flies. It is important to avoid a repetition of that ghastly episode.

Up to the time of writing, Britain has been unwilling to approve even a trial of the proposed plan. Much sympathy exists for her viewpoint, for she fears that the Germans will directly or indirectly get the food or benefit by its importation. This feeling is especially strong before one examines the proposed safeguards to prevent such a possibility.

British May Change Mind

The decision, of course, rests with the British. Sensitive as Britain is to American public opinion at this critical juncture, there is much sentiment current in the United States that we have no right to try to influence British judgment in this manner. But there are growing indications that Britain may presently decide that food, properly administered in those democracies, can be a military and political weapon, as has been recently said by Anne O'Hare McCormick. Britain may well consider whether starving millions are likely to revolt or are more likely to go over to the enemy solely for the sake of a bread ration; whether or not people with full stomachs may not better be able to keep up passive resistance. Many in the United States are convinced that before the winter is far along the British may of their own initiative revise their idea of where their own best interests in this matter lie.

Because of the vast quantities involved in a mass feeding program for 37,000,000 people, a few facts and figures will undoubtedly be of special interest to those engaged in food production and distribution in this period of great surpluses in this country.

Until now Belgium, Holland, Denmark and Norway for their foodstuff needs depended vitally upon the Western Hemisphere. France, however, depended less on the Western Hemisphere, importing her needs mostly from her colonies, from which she is for the most part now cut off.

Belgium normally imports 50 percent of its food supplies; Holland, 35 percent; Norway, 50 percent. In each of these countries, and likewise in France, it is estimated the domestic production this year was cut in half by military operations, removal of farmers from plowing and planting, and by the devastation of growing and stored crops. Their import needs therefore amount to 75, 65 and 75 percent, respectively, of their total requirements.

In 1938 these five countries—Belgium, France, Holland, Denmark and Norway —imported from the Western Hemisphere grains and cereals totaling 4,344,200 tons, of which U.S.A. furnished 44 percent, Argentine 40 percent, Canada 15 percent and other South American countries 1 percent. (Meat imports were 63,800 tons, of which 90 percent came from South America.)

In 1938 these same countries imported from the rest of the world (exclusive of the Western Hemisphere) a total of 2,213,000 tons of grain and cereals—about half as much as they took from North and South America. Added together, the total is impressive: 6,557,200 tons. Some idea of what such figures mean in relation to the total food staples exported annually from the Western Hemisphere is gleaned from the following amounts that these five democracies have been taking annually: 62 percent of all rye exports, 53 percent of all oat exports, 34 percent of all bran and fodder exports, 24 percent of all corn exports, 21 percent of all wheat exports, and 18 percent of all barley exports.

If Great Britain will permit food for these distressed populations to pass through the blockade (with proper safeguards and commitments from the Axis powers), the money is ready with which to pay for it before it leaves the countries of origin in the Western Hemisphere. And the ships are available.

Head G-Man on Anti-Sabotage

J. Edgar Hoover offers aid in protecting your factory from spies

HOW to protect your own factory against spies and saboteurs is as much your job as it is a job for F.B.I.—despite the accusations of the Dies Committee. J. Edgar Hoover, Director of the F.B.I., explains industry's part in defense precautions in the accompanying letter addressed to Associated Business Papers, Inc.

FOOD INDUSTRIES is glad to comply with his request that all member publications bring it to the attention of industry. Remember that only *qualified* executives are eligible to receive the booklet prepared by F.B.I. and mentioned in Mr. Hoover's letter. If you are properly qualified, you are urged to procure and study the volume.

JOHN EDGAR HOOVER
DIRECTOR

Federal Bureau of Investigation
United States Department of Justice
Washington, D. C.

October 31, 1940

Associated Business Papers, Inc.
369 Lexington Avenue
New York, New York

Gentlemen:

In the war-torn world of today America must strengthen her internal and external fortifications if she is to survive the menace of totalitarianism. The protection of our industrial facilities to insure the uninterrupted production of goods and material is essential to our national defense. Based upon this premise the FBI in September of 1939, in accordance with the request of the War and Navy Departments, inaugurated a program to survey the protective facilities of manufacturing establishments having large contracts to provide the government with defense materials. The purpose of the surveys is to submit recommendations to bolster the physical protective facilities of the manufacturing plants for the prevention of sabotage and espionage activities.

The first and final responsibility to give speed and strength to our national defense program by protection against espionage and sabotage lies with industry itself. Only through the energy and alertness of its officials and workers will the full measure of preparedness be attained.

In line with this plant survey program and to assist industrial concerns and municipalities in establishing effective protection against possibilities of acts of espionage and sabotage the FBI prepared a comprehensive booklet entitled "Suggestions for Protection of Industrial Facilities." Because of its confidential nature this booklet is limited in distribution to heads of duly constituted law enforcement agencies and executive officials of industrial concerns manufacturing defense materials under government contracts.

In response to the many questions as to how to obtain this publication I wish to state that a copy will be furnished an industrial concern upon the written request of an executive official.

Sincerely yours,

J. Edgar Hoover

John Edgar Hoover
Director

It Pays To Talk Shop With

General Mills proves that in regional stockholder meetings, something new in industrial relations. But that is only climax of a complete industrial relations program which begins in the company's plants.

By HERBERT E. FLEMING, *Chicago, Ill.*

REGIONAL stockholder meetings, something new in industrial and public relations, were held during the past year by General Mills, Inc. Conceived by Chairman James F. Bell to increase the interest of stockholders in company affairs, these meetings have proved to be of much greater importance. They brought out 25 to 30 percent of the 9,865 stockholders. Compare that with the attendance of three individuals at the regular 1939 annual meeting in Wilmington, Del. And, as hoped, the meetings gave Mr. Bell and his associates the desired opportunity to discuss managerial problems face-to-face with representative stockholder groups in Boston, Chicago, Cleveland, Detroit, Los Angeles, Minneapolis, New York and San Francisco.

These meetings also made it possible to acquaint stockholders with the company's products. The importance of this should not be overlooked, because 47 percent of the stockholders, scattered over the country in all walks of life, are women and have an influence on consumer buying; 3.2 percent are employees.

But, as interested as stockholders were in sales, profits, dividends, grain purchases to offset flour sales, and similar subjects, they raised in particular the question of management and employee relationships. A typical question by stockholders was: "How about wages, conditions of work, and collective bargaining in our company's plants?"

If Mr. Bell had not been able to give straightforward answers, the meetings would have been flops, and the stockholders would have had reason to question the safety of their investments. But, the accomplishments in employee relations over the past several years have been such that Mr. Bell was amply supplied with ready information to make favorable and reassuring replies. As a result the regional stockholder meetings became focal points for the continued building up of good will for the company in the minds of the general food-consuming public as well as in the minds of the individual stockholder and the plant employee, a valuable achievement.

At the regional meetings, stockholders were given an opportunity to put their company's products to an eating test. The result was new boosters.

Since 1937, General Mills has been informing its employees concerning company matters as fully as it has its stockholders. The medium used for both is the company periodical *The Modern Mill Wheel.*

For the past four years, *The Modern Mill Wheel* has contained a simplified and "humanized" annual report consisting of

This discussion of

PUBLIC RELATIONS

Contains ideas for

All Food Manufacturers

Because it reveals not only a new technic but describes many other things that have been done to better relations with employees, stockholders and the public. Good public relations begins at home, in the plants, because it is impossible to build lasting good will behind a smoke screen.

The Editors

General mills has plants and district sales offices scattered over the United States. In eight of these regions, stockholder meetings were held, presided over by Chairman James F. Bell, the man at the right. These meetings were followed by personal conversations between Mr. Bell and stockholders and by group discussions concerning the company's products.

an income and expense statement and a balance sheet. Technical accounting terms are avoided. Cartoons, sometimes millers in caps with their faces expressing joy over sales and gloom over taxes, are run side by side with figures showing how much more money came to the company through sales, how much has been expended and for what, how much a stockholder receives as return on his investment, and how much capital has to be kept in the business to finance each employee's job.

A postal card survey revealed that these interpretative annual reports are builders of good will among both the employees and the stockholders.

The latest development Mr. Bell had to report in the building of employee good will, a development favorable to a lowering of labor turnover, was the pension system starting January 1, 1940. While comprehensive and intricate, the plan is business-like. It provides for a retirement allowance which by definition is a combination of a "retirement annuity" from contributions by the individual employee and a "retirement pension" from contributions by the company for the individual employee.

The amounts of the annuity portions of the retirement allowances will depend on the rates of interest and the mortality rates applicable to the respective employees, just as if they used their accumulated contributions plus interest to buy annuities from an insurance company.

The pension portions contributed by the company are meshed in with and added to the social security retirement allowances provided by Federal payroll taxes of 1 percent on both the employees and the company. As a result, each employee's total retirement payments from all sources will be, as a rule, about twice as large as his social security payments alone.

To obtain the necessary funds to cover the years of service by the employees prior to the establishment of the retirement plan, General Mills took advantage of a windfall from the outlawed processing tax. During 1939 the company recovered a net sum of $1,659,522.57 from adjustments reached with the U.S. Treasury Department following invalidation of the A.A.A. by the Supreme Court.

In explanation for making use of these funds for employee retirement purposes, Mr. Bell, during the regional stockholder meeting stated: "We felt that the company was not entitled to this money; but knew of no way by which it could be returned to our customers from whom it came."

To this sum of $1,659,522.57, General Mills added $1,640,477.43 from earned surplus to make a total of $3,300,000, which is in the trusteeship of the Bankers Trust Co. of New York under the terms of a duly executed agreement as an irrevocable trust.

While the company reserves the right to discontinue making contributions, it is on record that it expects to continue them. Also, the agreement provides that all contributions made to the fund shall never revert to the company but shall be used solely for the employee beneficiaries. To that end the trust company is given exclusive control over investing the initial fund and the subsequent additions made by the company and the employees. In that manner the investment function is fully separated from the administration of the retirement annuity and pension plan involving direct relations with the employees. The latter is in the hands of an Employees Benefit Board appointed by the company directors.

In addition to providing for retirement annuities, this pension plan provides for disability benefits, death benefits and optional annuities for widows and orphans. Another good feature of the plan is that retirement is not mandatory at 65, the age prescribed for eligibility for retirement. After an employee

reaches that age, he may be continued in the service, with his own consent. However, such continuance is at the request of the company management.

Increases Efficiency

This retirement and pension plan was established because "experience has demonstrated that a comprehensive program of this character, with proper credits for past services of employees and officers, would increase the efficiency and morale of the entire organization." Aside from this company aspect, the plan has made a strong favorable impression upon the employees as shown by the employee participation in it. Although their participating is not compulsory, 98 percent, a total of 6,691, had signed up by April 1st, three months after it was proposed to them. Some 400 part-time and temporary employees are not eligible. Out of 7,072 eligible employees, only 72 had signed waivers; nine were still undecided.

Supplementary to, but not a part of, the retirement annuity and pension plan is the Health Association for all employees. Membership is voluntary.

General Mills, as of March 1, 1940, started off the association with a contribution of $15,000 and a commitment to supply additional funds. During the first year, the sum is to be equal to the total subscriptions by employee members. During subsequent years, the company fund is to be 20 percent of the employee subscriptions.

Under the Health Association plan, the employee pays an annual membership fee of $4.80, for which he gets a benefit of $15 per week up to 13 weeks in case of sickness or an accident; for a payment of 60 cents per month he is eligible for hospitalization benefits up to $200 in any 12-month period; and for an additional payment of 40 cents per month each dependent member of his family is eligible for hospital care up to a cost of $100 in a year.

While these pension and health plans are the most recent developments in the General Mills employee relations program, thy do not constitute the whole of it by any means. The company sponsors a credit union setup, supports and encourages an employee training program, maintains a safety program including interplant safety contests, and makes possible the formation and functioning of individual plant groups such as the Stewards Committee of the Buffalo Gold Medal plant.

Nine Credit Unions

Although the formation of credit unions is sponsored by the company, it has no financial interest in them. Nine of the company's plants and offices have credit unions. The first was organized in the Ogden, Utah, plant in 1929 and has been functioning with a loss of only $17.43 out of a total loan to members of $52,700. Membership in these credit unions ranges from 82 in the Rossford, Ohio, mill to 312 in the Minneapolis mill. The Minneapolis general office has a separate group of 271 members, and, like the Minneapolis mill group this has been functioning ever since the early months of 1935.

The company's employee training program is carried on by A. D. Hyde, Director of Manufacture, as one of his official duties for the company. It is organized and carried on as a means of equipping employees for promotion. The training courses included are classified as: (1) Foremanship training, (2) technical milling, and (3) practical milling for graduates of technical schools and colleges.

Foremanship training has to do with maintenance, milling operations, packing and loading. Power foremen also study management in its many phases. This course is given during the fall, winter and early spring with weekly sessions and group discussions every two weeks.

The technical milling course is available to any employee sufficiently ambitious to study for a better job in the manufacturing end of the business. This course is conducted during the fall and winter months by plant superintendents. It covers such subjects as all phases of manufacturing operation from texts prepared by members of the supervisory staff.

The third course is, as its name implies, for the purpose of adapting knowledge gained through technical training to the work of the operator miller. This course carries on the year around under the guidance of manufacturing management. It covers such activities and functions as: Mechanical, production, technology and supervision.

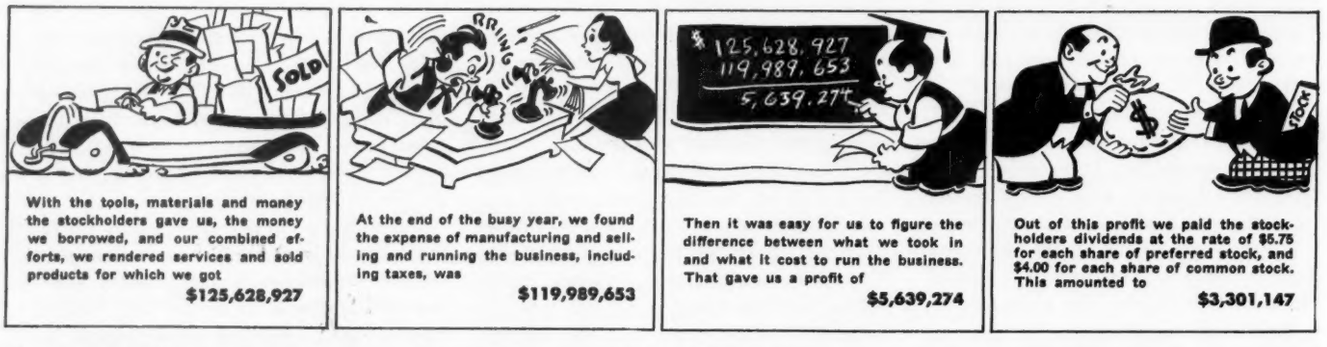
In its safety program the company has an activity that engages the lively interest of employees in all its plants. One of the incentives has been a two-year safety contest. This contest was given a sports flavor by grouping the plants into leagues named after the baseball associations. The Louisville, Ky., plant which won first place in the National League, had a "No Accident" rating for a total of 399,996 man hours of operation.

Set Safety Record

That this program is producing results is indicated by the fact that during the past three years the General Mills plants have led the flour milling industry in the three divisions of the National Safety Council reports. Its accident frequency rate is 8.26, compared with 13.48 for the industry as a whole. Its severity rate is 0.88, against 2.92.

With such a well integrated and employee-sanctioned program of employee-management relations in operation, Mr. Bell had no difficulty in answering promptly and satisfactorily any critical questions on employee relations from the stockholders present at the regional meetings.

As a result, these regional meetings worked out so well for General Mills, Inc., that Mr. Bell stated: "General Mills hopes that it will be a contribution toward a better understanding between all those who own American business (18,000,000 individuals) and those who run it."


SOLD
With the tools, materials and money the stockholders gave us, the money we borrowed, and our combined efforts, we rendered services and sold products for which we got
$125,628,927
BRING
At the end of the busy year, we found the expense of manufacturing and selling and running the business, including taxes, was
$119,989,653
$125,628,927
119,989,653
5,639.27
Then it was easy for us to figure the difference between what we took in and what it cost to run the business. That gave us a profit of
$5,639,274
Out of this profit we paid the stockholders dividends at the rate of $5.75 for each share of preferred stock, and $4.00 for each share of common stock. This amounted to
$3,301,147

Sugar-coated pills of company finance and accounting are used by General Mills to get employees and stockholders to understand the significant facts of the year's operations. This removes criticism that comes from misunderstanding. The cartoons are from General Mills house organ, *The Modern Mill Wheel.* A film employing the same technic is shown to stockholders.

Acme

German soldiers marching toward Arc de Triomphe in Paris. Army ration was important factor in Germany's success.

Foods That Aided Blitzkrieg

Facts about the German army ration—a review based on information published in Germany. Food technology contributed much to Nazi military might

FAMINE may stalk over Europe, but the German soldier apparently remains well fed. Recent articles in German newspapers, inspired undoubtedly by official sources, extol in most enthusiastic terms the virtues of the army ration. Propaganda they may be, but the fact remains that the German soldier has given a remarkable exhibition of human endurance in campaign; and without adequate and well-balanced rations his performance would never have been possible. To be able to fight, men still must eat.

In Poland, Norway, Holland, Belgium and France, German foot soldiers marched day after day, covering 25 to 30 miles in 24 hours in all kinds of weather and over varied terrain, with little or no rest, and arrived at their destination ready to do the prescribed job. Word got around that the Germans were using drugs in the form of antifatigue tablets. If there are such pills, no mention has been made of them in the German newspapers, but an analysis of the ration throws some light on the German soldier's ability to perform.

To the lowly soybean, the German High Command attributes a great deal of the success of the army ration. The basic components of canned meat and sausage which featured the World War ration have been replaced by an ersatz known as "Edelsoja."

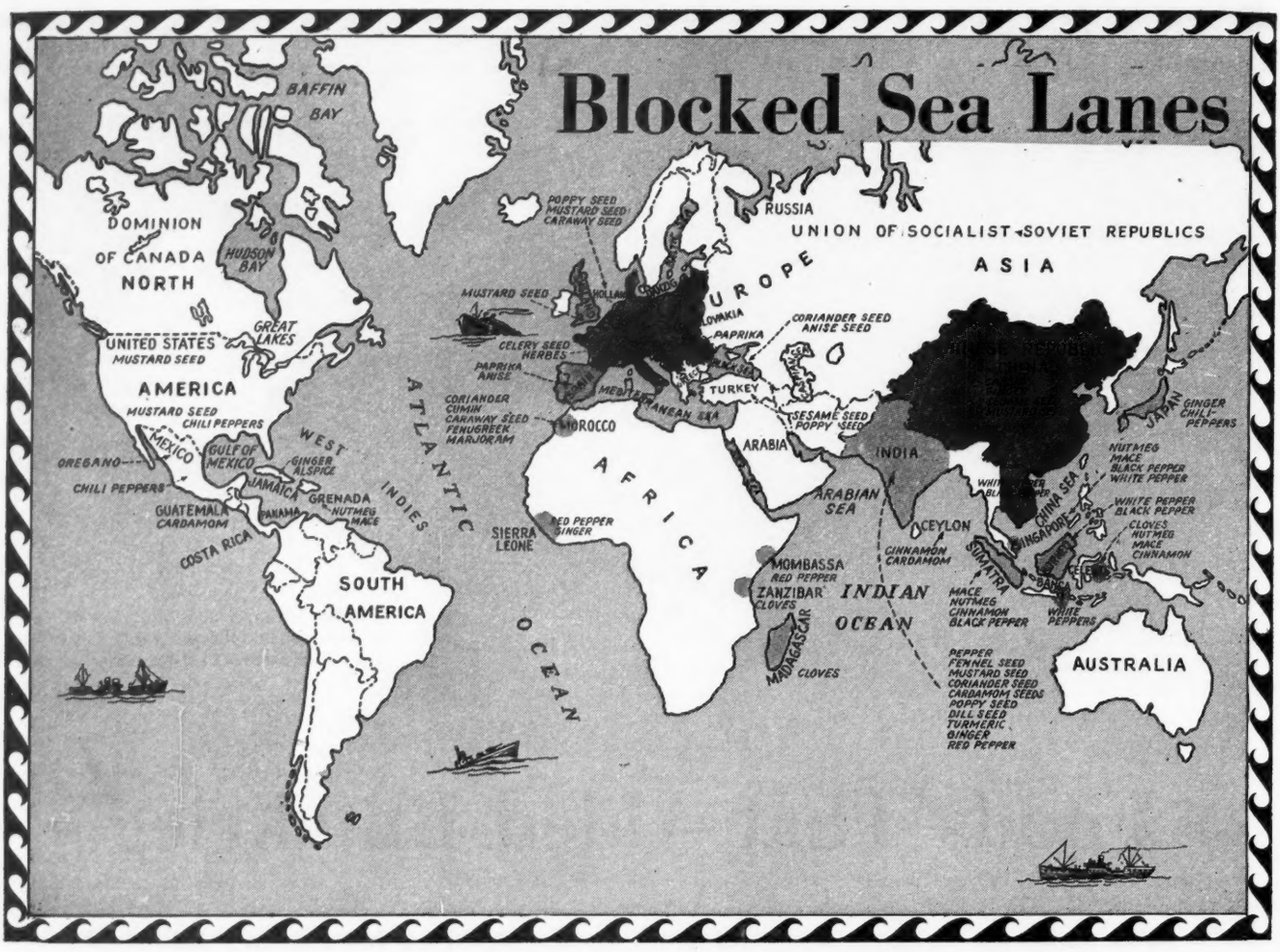
Edelsoja is a soybean flour, with a high protein content of 40 to 45 percent, and fat and carbohydrates. The flour is added to soups, bread, pastry, and macaroni. The soldier thus is supposed to get his balanced needs of protein, fat and mineral salts without the use of meat, milk or eggs. The savings in bulk tend to simplify the problems of packing and transporting. The German soldier can carry in his haversack a three-day ration of soybeans, and reserves are not difficult to deliver. The High Command confidently feels that with a supply of soybean rations, the Army can march anywhere without grave concern about its subsistence.

Confronted with the possibilities of a tin shortage, the German Army fell upon the idea of converting food forms so as to make possible their packing in other containers. As a result, the soldier now gets his tomatoes, cheese, jam and applesauce in powder form. When cheese powder, for instance, is poured into a pail and mixed with cold water, it is said that it emerges in solid form which can be cut in the usual way. Apple powder plus cold water makes applesauce. The opportunities for savings in transportation are obvious.

Another substitute for meat that is used in the German Army, known as "Bratlings," is derived from raw materials such as vegetable and animal albumin. Added to cabbage rolls, meat balls or chopped meat dishes, it tastes like meat and satisfies the appetite, the Germans claim.

The predilection for powders is carried to Bratlings. There is a Bratling powder, a mixture of soybean, grain and

(*Turn to page 79*)



On this map of the world, which shows the most important sources of spice materials, the heavily shaded areas indicate regions cut off from United States trade by the war, while lighter shaded areas are those with which trade is still open, but is becoming more difficult. Unshaded areas are not affected and are free to unrestricted trade.

SCARCITY of cargo space and restrictions on shipping, caused by the war, seriously threaten the supplies of spices upon which American food industries depend. But before surveying in detail what the war has done to the spice trade, is there anything that can be done about existing and prospective shortages?

Importers and wholesalers are pretty generally agreed that most spices grown in the Old World cannot be exactly duplicated in South America, as some have hoped. Spice plants are peculiar, and most of them can only be made to produce economically in a few limited areas, where soil, moisture and climate combine in the most suitable way. For example, pepper and other plantings have been tried in every part of the world, but they do not thrive, either in the heavy jungle of the Amazon basin, or on the high plateaus, plains and mountain slopes. According to M. L. Van Norden, of Van Norden & Archibald, a New York spice house, cloves from Zanzibar and other spices from every tropical country have long since been tried in South America, but without success.

Nor is there much likelihood that wild spices will yet be discovered, to act as substitutes for those cut off from us by the war situation. Intensive exploitation covering several past centuries makes this unlikely.

The senior member of John Clarke & Co., New York's veteran of the spice industry, considers the present situation far more serious than at the time of the World War of 1914-1918. He anticipates great shortages if the war does not soon end and, except for black and white pepper, believes there is little spice afloat to supplement the small stocks on hand. Nor will he venture to predict what may lie ahead.

Present Supply Situation

Specifically, what is the situation facing American spice men at the date of writing? Pepper, the spice imported in greatest quantity, fortunately can still be shipped. And, since European countries have not been able to buy it at all, New York has become the one big market. There are now 37,000 tons (600,000 bags) on hand in New York, enough to last for some years. (Mr. Van Norden estimates that this pepper stock should last for another two and one-half years and in that the New York importer, B. H. Olds, agrees, while some other spice men, like Arthur C. Tag of Archibald & Kendall, put the time at nearer four years).

It is still possible to get black pepper from Singapore. Most of this comes from Hong Kong, the best from the Saigon district (French Indo-China). According to a spice map published by Durkee Famous Foods, a circle of 500 miles radius with Singapore as center would include most of the pepper-producing areas, such as Borneo, Sumatra, Indo-China and the southern tip of India.

With the war blockade likely at any time to close additional sea lanes, no one knows how long any spice can be obtained. Daniel Doody, of Durkee's,

Threaten Spice Supplies

Elmhurst, N. Y., considers pepper stocks most precarious just now. Black pepper, which was priced at 4 cents per pound on December 9, 1940, rose to 28 cents in 1917. In contrast, all spice prices are comparatively low at present. The industry has remained remarkably steady, the spice men agree. While some have failed to see the handwriting on the wall and are beginning to get nervous, others are stocked up and hope to go on.

Cinnamon, Mace and Nutmeg, Cloves and Ginger

Very little Ceylon cinnamon has been coming into the United States lately, and cassia (Chinese cinnamon) has been cut off by the Japanese blockade.

Nutmegs, native to Banda in the Dutch East Indies, and once a Dutch monopoly on Amboina, also slyly planted by the French on Mauritius and the English at Penang, have been successfully grown on Grenada in the British West Indies. Production in Grenada is increasing, so that the situation is happier with regard to nutmeg and mace (a product of the nutmeg tree) than with cinnamon.

Though excellent cloves grow on Penang and Amboina in the Dutch East Indies, most cloves come to us from East Africa and Madagascar. Zanzibar has an ideal climate for growing cloves. However, it has lately taken many days to get a telegram through to Zanzibar, and supplies are as uncertain as communications, according to Mr. Van Norden.

Though a fine grade of ginger has been grown in West Africa, that source of supply is now exhausted. Also, ginger from China and India is now cut off by shipping difficulties. Fortunately, ginger grown in Jamaica, at our Caribbean doorstep, is second to none.

Importers and wholesalers, finding themselves with limited spice stocks, and cut off from trade with increasing areas of the world, take steps to avoid serious shortages

By ALLEN CHAFFEE,
New York, N. Y.

Other Spices

Pepper (black and white), cinnamon, nutmeg, cloves and ginger make up three-quarters of the total spice pack at Durkee's, but there have been 30 or more spices regularly available to them. A survey of the list as a whole, which is fairly representative of the spice trade, reveals some heavy casualties, balanced by the fact that other items can be obtained near home.

What of allspice, anise, caraway seed, cardamom, celery seed, chili, coriander, cumin, mustard, paprika, poppy seed, saffron, sage, savory and thyme?

Allspice, for one, grows wild and is distinctly a plant of the Western Hemisphere. Found chiefly in Jamaica, it is superior to the so-called allspice found in Mexico, which tastes more like bayberries than the familiar combination of cloves, cinnamon and nutmeg.

Anise from Spain is hard to get. But good anise also grows in Mexico, where soil and climate are somewhat similar.

Cardamom seeds are at their best in only one district of India and in Ceylon. However, this spice is also grown to some extent in Central America and production there may come to be our main dependence.

Caraway seed from Poland was one of the first casualties among spice imports, and later the excellent caraway seed of the Netherlands was cut off from American trade. Some caraway is grown in Morocco, but is not readily available under present conditions of foreign trade.

Fine celery seed had been coming to this country from France, but that, too, has suffered a blackout. Now, some firms are trying to get this product from India.

As for chili, while there are some imports of hot peppers from Sierra Leone and Zanzibar, chili peppers can be grown in Louisiana. These are not as hot as the imported kind, but hot enough, says Mr. Van Norden. Growing popularity throughout the country of highly special Texan and Mexican dishes such as chili con carne has led one of the spice firms previously mentioned to develop a chili powder of the chili ground from Mexican Rio Grande red peppers in combination with Mexican oregano and comino (cumin). Other spice producers make similar chili powders.

Coriander can no longer be obtained from Russia, but has lately been imported from Morocco.

Cumin seed, produced in Morocco, is also available from Mexico.

Marjoram of excellent quality is grown in France, but is now unavailable. This spice also is grown, though not of as high quality, in Germany and North Africa, both difficult of access under present conditions. However, this product is the one exception to what has been said about South America, as it grows in Chile, where we may look for our future supply.

Mustard grows all over the world, but some of the finest was brought here from Denmark and Holland, and this can no longer be obtained. However, a very fine grade of mustard is being shipped from England and, while the price is somewhat high, it is not higher than it has sometimes been in the past. There was quite a mustard flurry during the World War, Mr. John Clarke points out; but California and Montana are growing good crops, though they are not producing enough as yet to supply the American demand.

Paprika cannot be shipped from Hungary since Italy entered the war, nor are shipments getting through from North Africa. But a vey fine grade of paprika from Spain, where the quality is government-controlled, has been shipped from Atlantic ports and the same is true of the Portuguese paprika. But no one knows how long that state of affairs may continue. Spanish paprika was hard to get during the Spanish civil war. Happily, paprika produced from Mexican pepper pods is being manufactured in California.

Poppy seed from Poland and also from the Netherlands has ceased to be exported. But some spice houses are

(*Turn to page 75*)

Makes 14 Trucks Do Work of 18

Rearranges routes so that each truck delivers more orders and more tonnage. Uses control records. Purpose is to reduce delivery expense to 1.75 percent of net sales

ECONOMIES in operation and in mechanical maintenance are the two avenues of approach when the management of a motor truck fleet in the food field seeks to cut its delivery expenses. This is a story of how one company in the food field through economies in operation reduced the size of its delivery fleet from 18 to 14 trucks, a reduction of 22 percent.

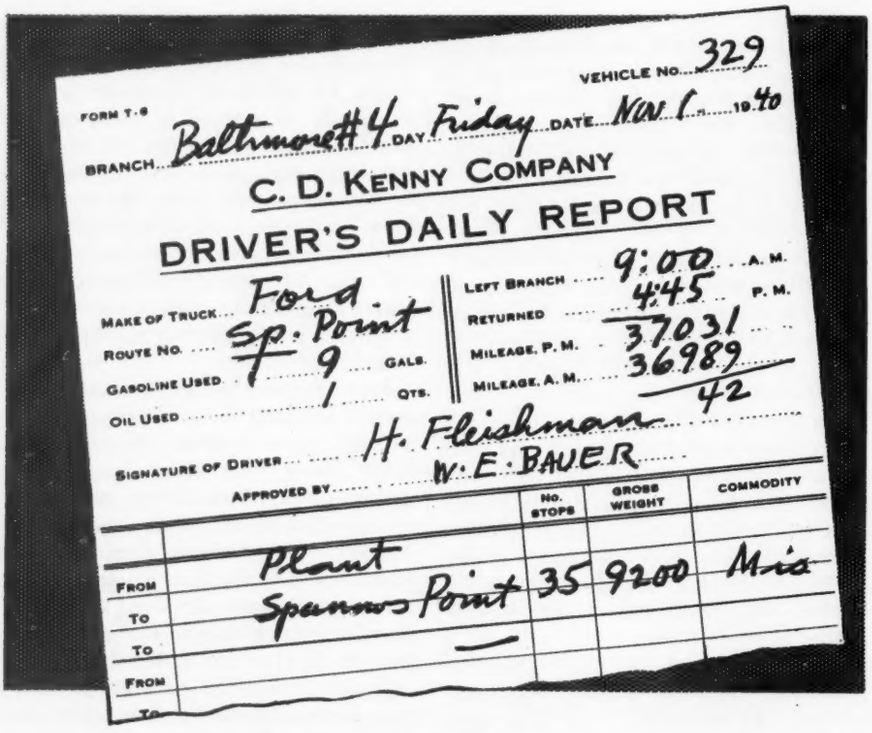
The name of the company making the saving is the C. D. Kenny Co., Baltimore, Md., wholesale grocer with 43 branches, mostly in the South. The above reduction in the size of the fleet was made, however, in the local Baltimore branch of the Kenny company.

The company is employing the same procedure at its other branches to bring the delivery expense at these branches to 1.75 percent of net sales. When the delivery expenses at the local Baltimore branch exceeded that figure, the problem was attacked from the operations angle in an attempt to get fewer trucks to make the same deliveries as before.

This called for close cooperation with the branch sales department in an effort to so rearrange the routes that each truck could be made to deliver more orders and greater tonnage without affecting service to the customers so as to lose any of the existing business.

The first step in the solution of the problem was to divide the city and outlying territory comprising the delivery area into zones equal in number to the number of salesmen employed. The next step was to spot the existing accounts on the map showing the salesmen's zones. The third step was to readjust the zones on the map, assigning to each zone approximately 250 accounts or retail outlets.

The apportionment of 250 accounts was based on the ability of each salesman, with a limited line such as that of the Kenny company, to make approximately 50 calls a day, five days a week. It was also felt that in making not over an average of 50 calls a day, each salesman could spend enough time with each customer to help plan his sales efforts and thereby increase his Kenny purchases.



FORM T-6
VEHICLE NO. 329
BRANCH Baltimore #4 DAY Friday DATE Nov 1 19 40

C. D. KENNY COMPANY

DRIVER'S DAILY REPORT

MAKE OF TRUCK Ford
ROUTE NO. Sp. Point
GASOLINE USED 9 GALS.
OIL USED 1 QTS.

LEFT BRANCH 9:00 A. M.
RETURNED 4:45 P. M.
MILEAGE, P. M. 37031
MILEAGE, A. M. 36989
42

SIGNATURE OF DRIVER H. Fleishman
APPROVED BY W. E. BAUER

		NO. STOPS	GROSS WEIGHT	COMMODITY
FROM	Plant			
TO	Spanns Point	35	9200	Mis
TO	—			
FROM				
TO				

A typical Driver's Daily Report as used by C. D. Kenny Co., wholesale grocer with headquarters in Baltimore, Md., and branches in 42 other cities. When filled out as shown above, this form is the source of information as to where the truck goes, what load it carries, how many stops it makes, how many miles it runs, how much gasoline and oil it uses and when it leaves and returns to its branch warehouse.

One Zone to a Salesman

The fourth and fifth steps in the solution of the problem were to assign one of the zones to each of the salesmen and to spot in each zone the existing customers of each salesman. This brought out the fact that each salesman had customers in more than one of the newly established zones.

This in turn called for a reassignment of the customers so that each salesman's customers were located solely in the zone assigned to him. Before any customers were transferred between salesmen, the salesmen involved exchanged all pertinent information concerning each customer. So the new salesman handling the account could start off with a full knowledge of the customer's needs

FORM T-6 (LARGE)

Branch Baltimore, #4 — C. D. KENNY CO. — Day Friday Date Nov 1 19 9

DAILY TRUCK REPORT

Signed N. E. Bauer

Truck No.	Truck Make	Tons Cap	Driver	Time Out	Time In	Route	No. Trips	Speedometer Start	Speedometer Finish	Miles Run	Gals. GAS	Oil Qts.	No. of Stps.	Wght. Moved Lbs.			Remarks
329	Ford	1½	H. Fleischman	9:00	4:45	Sp. Point	1	36989	37031	42	9	1	35	9200			
340	Ford	1½	Zurline	8:00	4:30	Munch. Square	1	2769	2786	17	7	0	47	6400			
358	Chev	1½	Bridges	8:15	5:30	N. of Lf.	1	20798	-816	18	3	0	58	8200			
394	Chev	1½	J. Fleischman	8:30	5:00	Spec. East	1	10177	-197	20	3	1	54	4000			
			Bush	8:10	6:15	Westport	1	3188	228	40	6	0	62	5400			

This is a portion of the daily master control sheet as used by C. D. Kenny Co., Baltimore, Md., to indicate the work performed by its fleets of trucks in Baltimore and 42 other branches. It gives a summary on one sheet of the information originally obtained individually on the Driver's Daily Report pictured on the opposite page. A quick study of the summary sheet shows which of the trucks have performed a good day's work and which have not. This permits corrective action.

as to the kind of goods previously purchased.

The assignment of a salesman's customers all in one zone had two important benefits, each an adjunct of the other. In the first place, it reduced the amount of travel required by the salesman to cover his territory, and this in turn gave him more time with each customer. And with more time spent with each customer, it should follow that the customer's Kenny purchases will eventually be increased.

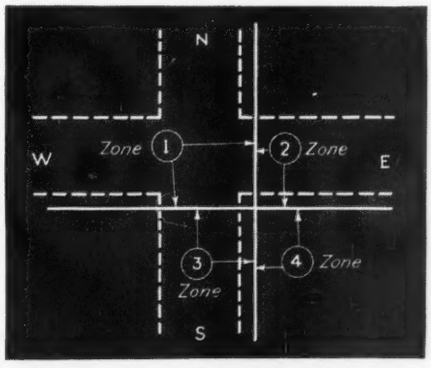
Past Sales Studied

With the program thus far establishing new selling zones in which each salesman would concentrate, the next step in the procedure was a study of the past sales tickets of each customer. This brought out the fact that many customers ordered small amounts every day or three or four times a week.

These daily or every-other-day orders naturally reduced the average value of the sale, and in addition required a larger number of truck deliveries than would be necessary with any combination of the customers' orders.

Accordingly, an area approximately eight miles in radius in which truck deliveries would be made once a day was laid out on the map outlining the salesmen's zones. In the out-of-city territory beyond the once-a-day delivery area, extending approximately for a radius of 30 miles, certain areas were designated to receive one delivery a week and others two deliveries a week, in accordance with the volume of sales in those areas.

All of the above information was transmitted to the salesmen so that they and the delivery supervision could work in complete harmony. After the plan had been in effect a week, four trucks were taken out of service and sold. The combination of many small orders into fewer larger ones had made this reduction in the truck fleet possible.



Sketch of a street intersection at the corner of four zones or salesmen's territories. The white solid lines indicate the dividing lines of the zones as designated by the numbers inside the circles. This makes it easier to route the deliveries on the dividing line streets and eliminates the operation of one truck on each side of the street, one in one zone and one in the other.

In addition, the total weekly fleet mileage had decreased more than the total weekly mileage of the four trucks removed, and on the same volume of business. As an example of the increased tonnage delivered per truck, a total of 12 tons delivered on a group of four 1½-ton trucks to 200 stops on Monday, Tuesday, Thursday and Friday was handled by two of the same trucks to 160 stops on Tuesday and Thursday.

Delivery Simplified

A knotty minor problem arose in how best to place the customers in each of the four salesmen's zones at the corner or four-way intersections of those zones. This was solved by assigning the stops on the east side of the north and south street to the salesmen having the zones to the west and assigning the stops on the south side of the east and west street to the salesmen having the zones to the north. This method is shown in the accompanying sketch. It has the advantage of having only one delivery truck serve both sides of a street at a four-zone corner intersection.

Reports Permit Control

In the work of rerouting the trucks and of maintaining an adequate control of the work, the Driver's Daily Report and the Daily Truck Report shown herewith were important factors.

The Driver's Daily Report is the source of the data covering the work done by each truck each day. Aside from giving the weight delivered; the number of stops and the mileage run, it also gives the time the truck leaves the branch each morning. This is an important factor in getting the trucks away early.

The Daily Truck Report summarizes the work of all the trucks on one sheet and furnishes the control of the fleet operation.

Factors To Consider When Size-grading Granular Materials

Discussion of the use of sifters, sieves and screens in separation of such materials as grains, seeds and powdered foods

By RUDOLF KOHN, Kipp-Kelly, Ltd., *Winnipeg, Man., Canada.*

SIZE-GRADING of dry granular food materials and products is normally accomplished with some form of sifting or screening equipment. To carry out this operation effectively, with the most suitable equipment, a number of aspects of the grading operation must be considered. These will be discussed, with examples taken mostly from the author's experiences during a considerable period before the present European war, when he was connected with a well-known European firm that specialized in separation or size-grading work.

For instance, flour milling consists essentially in close separation of the endosperm of the grain from the bran and the germ. This is accomplished by means of a series of gradual size reductions in roller mills, with intermediate separations by sieves and air streams. For separating flour from fine bran, not only differences in size, but also those in specific gravity are used. Both aspects of this problem must be studied simultaneously.

In malting plants and breweries, barley is size-graded through screens having oblong perforations, the separation being according to the width of the grain. Thus barley grading is by size-grading only. As the sugar content of the malt is increased considerably by close grading of the barley, the screening equipment has been steadily improved to meet the requirements of exacting maltsters.

When grading barley by hand on laboratory sieves, a reciprocating movement in the direction of the long axes of the oblong perforations must be used. By this means, a parallel position of the grain and the perforation is obtained, facilitating passage of the grain.

This discussion of

SEPARATION

Is of interest to

Processors of grains, spices, cocoa, other granular foods

Because it deals with the fundamentals of the sifting or screening of food ingredients and products of this nature. This separating operation is a unit operation of food engineering.

The Editors

Another separation requiring high grading precision is that of chick peas that are to be exported to Spain. This product originates in North Africa, where size grading is done on hand sieves having round perforations. The peas, being of irregular shape, are rolled and shaken on the sieves in order to facilitate passage through the perforations. Two workers, seated facing each other and holding the sieve between them, give it the appropriate motion.

Sieve Movement

These last two examples illustrate the necessity of adjusting the sieve movement to the requirements of the material that is being graded. Also, the size and shape of the perforations or meshes of the screen must be suited to the material. These considerations hold for both hand sieves and mechanical sifters and are especially true of flat sieves. But the general ideas expressed hereafter can be easily applied to cylindrical screens.

For separating non-dusty granular materials in accordance with the length of the individual grains, the indented drum is useful. This consists of a cylinder, rotating on a horizontal axis. Indentations of suitable size and shape cover the interior surface of the drum. These indentations usually are from 1 to 15 mm. in diameter. The material to be separated is fed to the interior of the drum and all the grains smaller than the diameter of the indentations are carried upward by the rotation of the drum, thus being separated from the larger particles. However, when the particles to be separated are round, as in freeing clover or alfalfa seed from weed seeds such as dodder, the results obtained by sifting and by the indented drum are equally good. The true field for the indented drum is in the separation of oblong particles from each other or from round particles according to length.

When size-grading finely divided materials, the sifting must be carried out over fine meshes, 200 or 300 to the inch. This decreases output considerably. In such cases, pneumatic separation may prove better and cheaper.

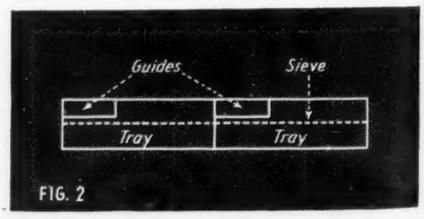


Fig. 2. Section on line X-X through gyratory sifter diagrammed in Fig. 3.

Grading Precision

In a preceding paragraph, the term "grading precision" has been used. This is a ratio by means of which the work of industrial separating equipment may be compared to that of a laboratory sieve having equal meshes or perforations.

On the test sieve in the laboratory, a small quantity of material is sifted until practically no more particles are passing through. From 2 to 5 minutes is generally required for this test. For certain industries, like brewing, the conditions of this test have been standardized in various countries.

In industry, where large quantities are handled, the grading precision will naturally not be the same as on the test sieve. The "tails" or "overs" will generally contain some "unders" or material that would have passed through a test sieve. The grading precision is the ratio between the "tails" over the industrial sieve and over the test sieve. A product graded with a precision of 95 percent therefore contains 5 percent of "unders."

The "throughs" may contain a restricted amount of larger particles, as some of the meshes may be more open than the standard. Tolerance for such variations should naturally be as small as possible. It can be seen that it would be incorrect to extend a laboratory test over too long a period, say more than 5 minutes, as that would give the large particles an excessive opportunity to pass through the large meshes of the laboratory sieve.

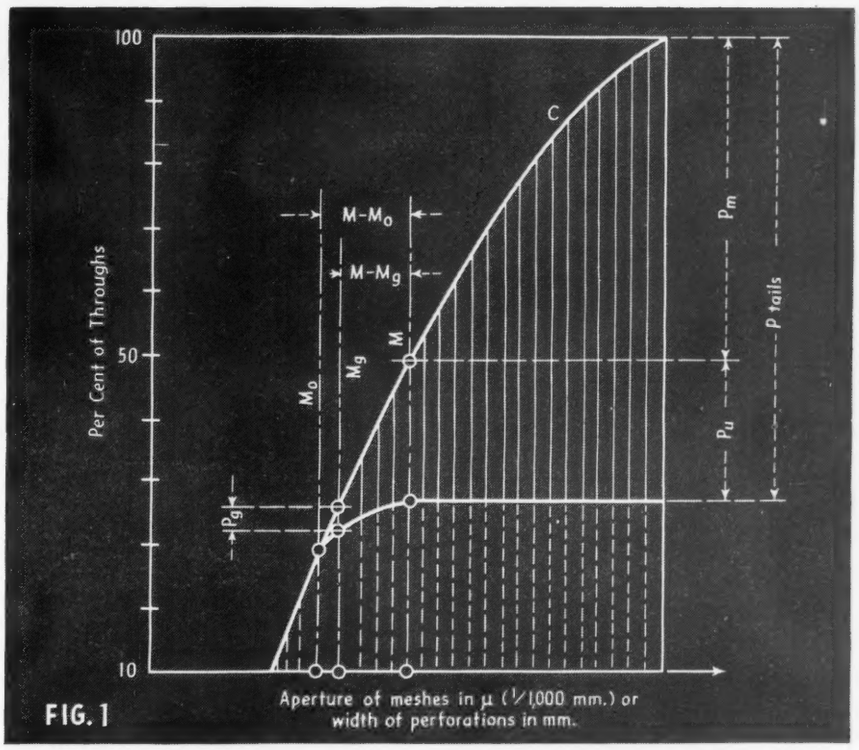


Fig. 1. This diagram of granulation represents a size-grading operation. Solid cross-hatching indicates the "tails," while broken cross-hatching indicates the "throughs." See text of article for full explanation of this diagram.

Grading precision shows the *result* of a grading operation. An actual evaluation of the process requires exact knowledge of the granulation of the graded and ungraded materials. This is clearly represented by the diagram of granulation, now commonly used in the European milling industry. The abscissas of this diagram represent the size of openings of the various test meshes, in μ or thousands of a millimeter when fine particles are sifted, and in millimeters for coarser materials. The ordinates indicate the respective percentages of the "throughs."

Diagram of Granulation

In a previous publication,[1] I have shown how different kinds of grading operations can be represented by diagrams of granulation (the details of which may be omitted from the present discussion). A number of conclusions can be deduced from such a diagram, as represented in Fig. 1.

In Fig. 1, the curve C gives the granulation of the material to be graded over meshes or perforations with size of aperture M. The composition of the "tails" is shown by the unbroken cross-hatching in the diagram while the broken hatching shows the extent of the "throughs."

The grading precision X may be expressed by formula

$$X = \frac{P_m}{P_{tails}}$$

where P_{tails} = quantity of "tails,"
P_u = quantity of "unders" in "tails,"
$P_m = P_{tails} - P_u$.

The diagram also shows that the diameter of the smallest particle in the "tails" is M_o, while the size of the apertures in the mesh is M and M_g is the size of the aperture in the test sieve.

The difference, $M - M_o$, is a very important characteristic of the sieve. Obviously, particles smaller than M_o easily pass through the meshes. Passage becomes more difficult as the size of the particle approaches M.

Grading specifications in the trade frequently state the percentage of "throughs" tolerated with a certain test sieve with meshes of dimension M_g. This tolerance is sometimes so strict that industrial grading must be performed on sieves with dimension M much larger than M_g of the test sieve. The difference, $M - M_g$, which is easier to establish than M_o, depends largely upon the construction of the sieve, and shows its capacity for the specified operation.

For example, barley for malting is sometimes exported under guarantee that not more than 5 percent (or even

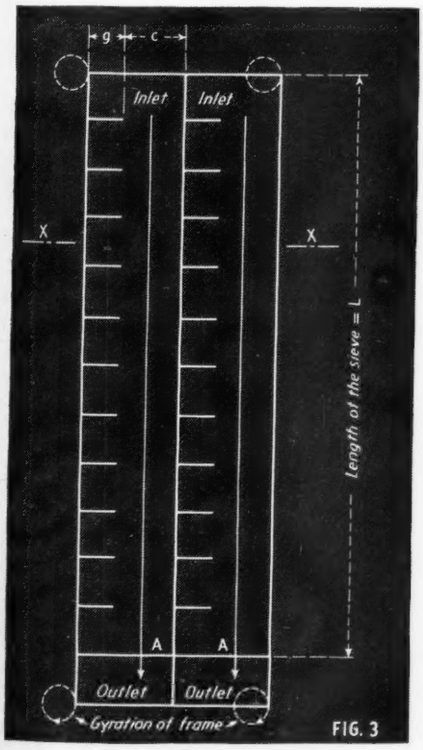


Fig. 3. Diagram of European type of gyratory sifter, known as a "Plansifter," showing position of guides.

2 percent) of the grain will be under 2.5 mm. When, after a bad crop, 50 percent of the grain is under this dimension, the sifting or grading problem becomes difficult. I have seen "modern" but inefficient plants operating with sieves of 3 mm. aperture, with the "tails" containing 8 percent or more of grain under 2.5 mm., while 95 percent of the ungraded barley passed through a test sieve with 3-mm. perforations. The larger the perforations in the screen, the more malting barley will pass through to the cheap feed barley, under 2.5 mm. in size.

By using the method just described for the study of separation problems, it becomes possible to make close estimates of cost and profit.

One other point that is evident from

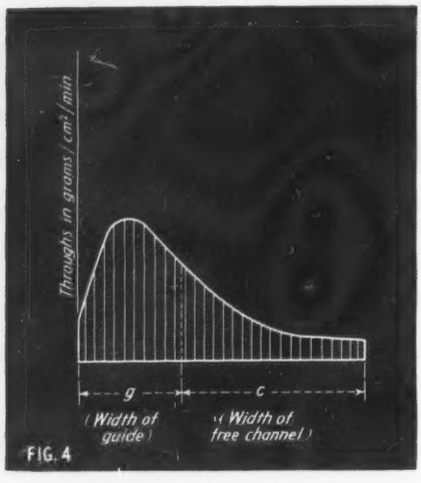


Fig. 4. Diagram showing the distribution of the "throughs" over the width of one of the two parallel sifting sections of the sifter shown in Fig. 3.

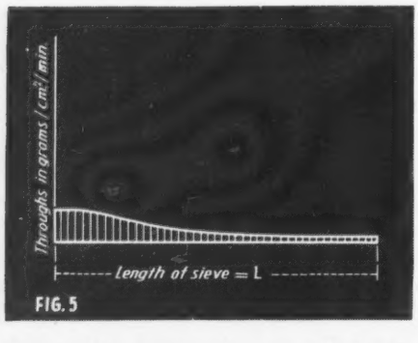


Fig. 5. Diagram showing the distribution of the "throughs" over the length of one of the two parallel sifting sections of the sifter shown in Fig. 3.

a study of the above method is that precise grading results can only be obtained when using screens that have exactly sized meshes or perforations. A discussion of suitable dimensions for screen perforations used in grain grading has been given by the author in other publications.[2]

Natural Classifications

Flat sifters are designed with various inclinations and drives. To evaluate these requires a knowledge of the action at all points on the screen surface. In the head or inlet section the layer of material being sifted is naturally thicker, and it is at this point that natural classification plays an important part in the separation.

By natural classification is meant stratification according to gravity. Under normal conditions, friction between the particles prevents this classification and suitable vibrations must be imparted to the mass of particles in order to overcome this friction. These vibrations must not be too great or the stratified layers are likely to be remixed.

As a result of natural classification, the center of gravity of the mass takes the lowest possible position. Therefore, the very small particles, passing between the larger, fall toward the bottom. As a result, the "throughs" at the head section contain a high percentage of these very small particles.

On the other hand, the "throughs" are mixed up, to a certain extent, with larger particles sinking toward the bottom because of their higher specific gravity. As the smaller particles pass through the meshes more easily, they constitute the largest part of the "throughs" in the head section. Thus, the granulation of the "throughs" will vary throughout the length of the screen, in spite of the uniformity of mesh dimensions.

Construction of Sifters

Researches on the operation of gyrating sifters of European types have been published by Prof. V. I. Iltchenko.[3] Reference is here made to this research, insofar as it bears on this discussion.

The self-balancing drive of the type of sifter referred to in this research, the "plansifter," causes each point of the surface to describe a circle having a radius of about 2 in. (see Figs. 2 and 3). While American gyratory sifters obtain movement of material over the screen by inclination of the screen or pressure of incoming material, European practice generally uses guides. Figure 3 shows such a sifter, with two independent, parallel sections. When the guides are arranged as shown in Fig. 3, they cause the material to move forward in the direction of the arrows.

Professor Iltchenko measured the quantity of "throughs" all over the sifting surface. The results are shown in Figs. 4 and 5. The quantity of "throughs" per square centimeter per minute is shown as ordinates in both figures, with the width of the screen as abscissas in Fig. 4 and the length of the screen as abscissas in Fig. 5.

Note in Fig. 4 that by far the largest quantity passes through the area between the guides. The particles that are only slightly smaller than the openings of the screen meshes can only pass through when in a vertical or nearly vertical position. By periodically stopping the horizontal movement of the particles, the guides contribute to this action, increasing the output and the grading precision.

On the other hand, these guides are likely to remix the stratified layers of the graded materials. This is undesirable when using the "plansifter" for grading millstocks, but can be neglected in grading materials like peas.

Cleaning Sifters

To keep a sifter working steadily and efficiently, the meshes or perforations must be kept clean. Various methods are available for this purpose. In some cases, light vibrations, applied to the screen by any one of several methods, are effective. When a strong tendency to clogging exists, various types of brushing devices are used to clean the screen openings from below.

Vibrating sifters with high speed and steep inclination seldom require any cleaning device, as particles with dimensions close to those of the screen openings can scarcely pass. Such sifters are usually recommended for large outputs when there is no necessity for high grading precision.

Other Considerations

It should be noted that there exist methods of separation according to specific gravity that are more efficient than the sifter or the conventional flour mill purifier. With a reciprocating movement, by crank or crankless drive, the particles are periodically stopped and larger particles get better opportunities to pass the screen. In general, the examples of hand operation of sieves, already referred to, indicate how to determine the most appropriate drive for sifting equipment.

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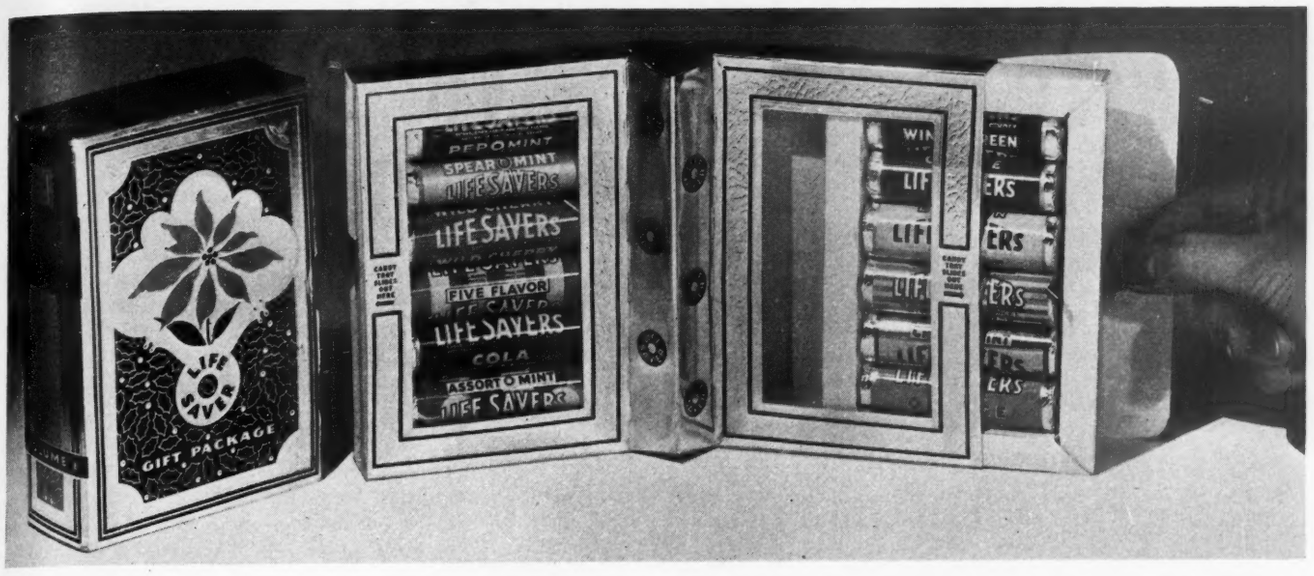
2. R. Kohn, Le nettoyage des bles a sec en moulins et semouleries, *Bulletin des Anciens Eleves, de l'Ecole Francaise de Meunerie*, No. 76, February, 1939; No. 80, June, 1939.

3. V. I. Iltchenko, Etude des mouvements des produits et du blutage sur des tamis de types differents, *Bulletin des Anciens Eleves de l'Ecole Francaise de Meunerie*, No. 73, November, 1938.



The "Life Savers Book" gift package opens up to display 12 unit packages in slide-out trays underneath transparent windows. The package is in holiday colors — red and green on silvery metal-foil-backed fiberboard.

Gift Package Aids Life Savers

Unexpected sales increase and new merchandising technic result from unusual assortment package

THREE years ago Life Savers Corp., Port Chester, N. Y., conducted an experiment in public relations which has unexpectedly resulted in profitable sales increases. The experiment also ushered in an improved merchandising technic. In 1938, Life Savers Corp. included in the letter which brought to stockholders the December 1 dividend check a folder announcing a special offer. Stockholders were given the opportunity of purchasing a Christmas gift-package assortment of 12 varieties of "Life Savers," which the company agreed to deliver to receivers of the gift.

The assortment of 12 five-cent packages of "Life Savers" was packaged in a folding carton shaped like a book, bearing the title, "A Sweet Story in 12 Parts." The price to stockholders for the gift package of 12 "Life Savers," including a sender's greeting card, was 50 cents, delivered anywhere in the U. S.

Shareholders responded to the 1938 offer better than anticipated, accounting for approximately 10,000 gift-package assortments, widely distributed. The reaction of stockholders suggested offering the gift package on a test basis to a limited number of retailers during the 1939 holiday season. The result justified further expansion of the plan. In 1940 the holiday gift package was distributed and sold through more than 100,000 retail outlets.

The "Life Savers" gift packages are assembled in a special container suitable for counter display.

Although the gift package assortment is now available in most neighborhoods at approximately the same price, and even though stockholders are advised of this fact in the folder which accompanies the year-end dividend check, they continue to order gift assortments from the company.

The gift package assortment has many advantages. Usually the gift package has an added attraction value, greater eye appeal. Its appearance, and often its size, induces retailer displays. The appeal of the gift package and the effect of the displays increase sales for both retailer and manufacturer.

A very important asset of the gift package is the fact that each sale is not only a plus sale, but also a volume sale. In the case of "Life Savers," with no additional effort the retailer converts a 5-cent sale into a 50-cent sale.

To achieve the appeal both desired and necessary in a gift package usually requires a relative increase in packaging costs. However, multiple unit sales justify special packages and package costs not warranted by unit sales.

Quality Control of Operations In the Beverage Plant

Part I—Control of Ingredients

By S. S. EPSTEIN, *chemist, and* M. KIRSCH, *president, Kirsch Beverages, Inc., Brooklyn, N. Y.*

PRODUCTION of uniform and high quality carbonated beverages requires scientific control. Establishment of a definite character for a particular type of soft drink or bottle of soda is dependent upon the consistency of its make up. The amounts of each ingredient in the beverage must be practically the same in every batch produced. Further, the bottle must have a long, stable shelf-life.

Since the finished soft drink is essentially a mixture of five ingredients—sugar, flavor, color, acid and carbonated water—it may be stated that uniform high quality products are merely matters of accurate measurement of biologically pure materials. Such observations are apparently simple in principle, but actual accomplishment is intricate.

It is our purpose here to explain and describe the technical control of bottling carbonated beverages in our plant. Water treatment, sirup preparation, flavors, carbonation, bottle washing, biological control coordination and laboratory activities are intended for consideration in the order given.

Water Treatment

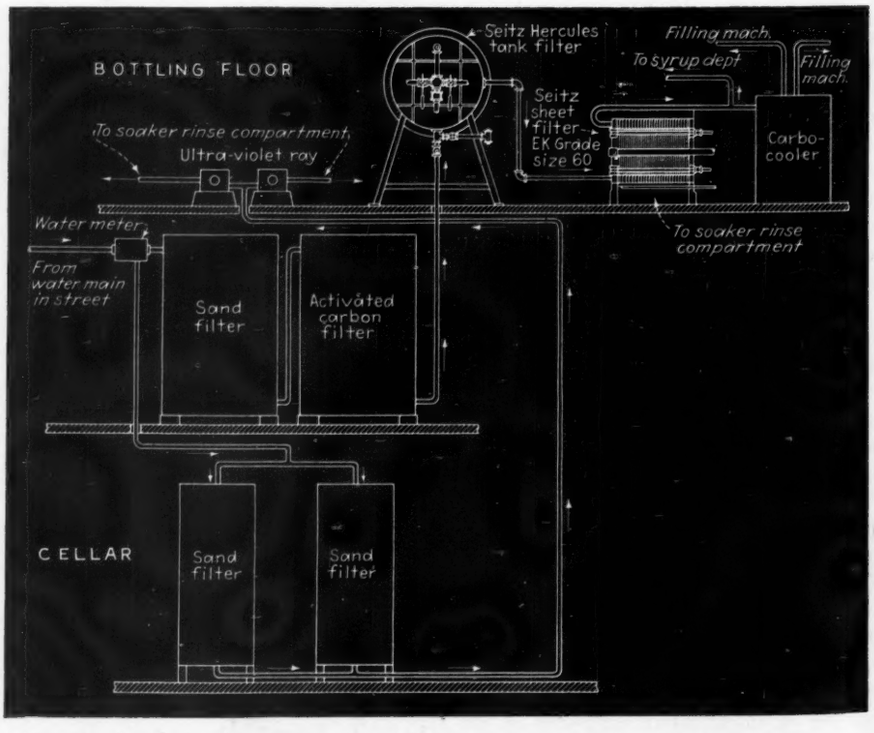
Water is the largest single raw ingredient used in the production of carbonated beverages. It is the least expensive, but nevertheless requires no less careful treatment than any other ingredient. High quality, potable municipal filtered water is not satisfactory for bottling purposes. Without additional treatment, sporadic unstable carbonation ("foaming") at the filling machine and sporadic impairment of flavor can be definitely anticipated. Suspended particles in the water will cause unstable carbonation. And characteristic chlorine, vegetable or algae odors and tastes, however slight, become intensified in the finished soft drink.

Fortunately, our raw water supply of municipal filtration origin is low in alkilinity and dissolved mineral matter and thus it requires no chemical treatment. The water is usually relatively free from organic matter, suspended matter, turbidity, color and odor. The paramount aim of water treatment in the plant is twofold: Improvement or perfection of physical characteristics, and elimination of all microorganisms.

When both bottle filling and bottle washing units are operating simultaneously, as they do during the busy seasons, about 700 gal. of water per day are used in preparation of flavored sirups and about 10,000 gal. are carbonated and introduced into individual bottles. When only one filling and washing unit each are used, the daily sirup requirements vary from 300 to 450 gal. of water and the carbonation needs vary from 3,000 to 7,000 gal., depending upon the bottling of 8, 12 or 29 oz. containers.

Each bottle washing unit requires about 5,500 gal. of rinse water per day. Thus the amount of water used daily in rinsing cleaned and sterilized bottles varies from 5,500 to 11,000 gal.

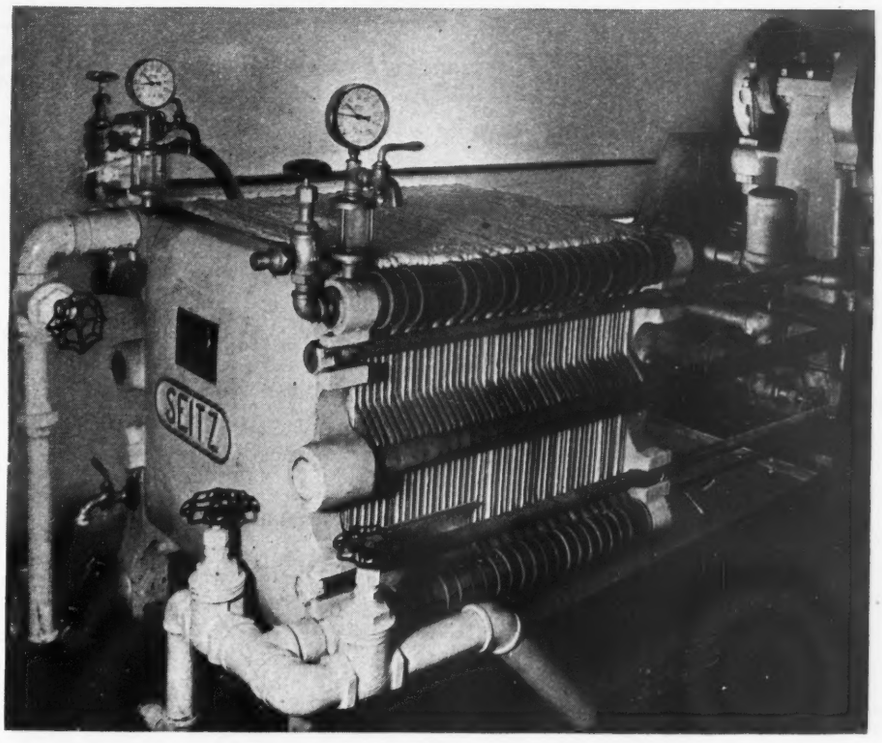
Water used for sirup preparations and for carbonation undergoes a series of filtrations. Municipal water is first passed through a 300 gal. capacity Norwood pressure sand filter of latest design. From there it travels through



Flow sheet for ingredient water and bottle rinsing water in carbonated beverage bottling plant of Kirsch Beverages, Inc.

a similar-sized Norwood activated carbon filter. The filtration rate is less than 2 gal. per square foot of filtering area per minute, so as to secure maximum filtering efficiency. The roughly filtered and deodorized water is then filtered through screened asbestos filtering material enclosed within a Seitz Hercules filter designed to give a fine polish to sand-filtered water. The final filtering channel is through a Seitz Germ-Proof filter. The clear, sparkling, sterile water is then led partly to the sirup room and partly into a closed "Carbo-Cooler" unit where it is simultaneously cooled and carbonated in an atmosphere of pure carbon dioxide gas entirely devoid of any air. The final passage of the cooled, carbonated and sterile water is to a filling machine from whence it is dispensed into clean and sterile bottles, each containing the required quantity of a flavored sirup.

Water used for the rinsing of cleaned and sterilized bottles from the washing machine is first passed through a series of two smaller pressure sand filters and then rendered sterile by passage through an ultra-violet unit. Each washing machine is provided with one ultra-violet unit through which water is treated at the rate of 10 gal. per minute.



Ingredient water is given a final sterilizing treatment in this Seitz germ-proof filter before passing to the carbonator and to the sirup department.

Controlling Water Treatment

Obviously, the water treatment outlined is devised to deliver a clear, odorless and sterile water to the sirup room and carbonator and a clear sterile water to the rinser of the bottle washing machine. Such an accomplishment is naturally dependent upon efficient operation of the system.

The sand filters are back-washed weekly and chlorinated when necessary. Backwashing is essential for uniform flow of water. Accumulation of suspended matter not only clogs up top sections of sand to reduce markedly the rate of filtration but may also provide an undesirable nest of microbial growth. The pressure of backwashing must be sufficiently high to raise effectively the upper sand layers and at the same time the pressure must not be so high as to cause streaking and loss of sand. It has been found that a water pressure of 30 lb. per square inch applied for 20 to 30 minutes yields desired results as observed at the sight glass located at the out-flow channel of the sand filter.

Chlorinations of sand and carbon filters are scheduled by results of bacteriological tests. Waters from various outlets, that is, from raw water, sand-carbon filter, screen filter and Seitz filter outlets, as well as from the ultra-violet units, are tested once or twice weekly. Media used include the standard nutrient agar (pH 6.8), lactose broth (pH 6.8) and malt extract broth and agar (pH 5.4). Incubation is at 28 deg. C. for 3 to 5 days. Tests for coliform bacteria are made according to American Public Health Association methods.

Repeated tests have shown that most microorganisms developing in malt-extract broth or on malt-extract agar are capable of growing in some types of carbonated beverages. For this reason, particular stress is placed on these tests, since quality control means practical sterility of the finished drink.

When the number of acid-growing microorganisms in water from sand and carbon filters exceeds ten per cubic centimeter, we resort to chlorination. Our index of effective chlorination has been arbitrarily placed at a minimum of 95 percent reduction in microbial content as based on tests with both nutrient and malt-extract agars. Our experience has been that the usual practice of 25 to 100 parts per million of chlorine passed through the filters for a period of 30 minutes does not yield efficient results. We have found it necessary to allow a concentration of 75 to 100 p.p.m. of chlorine to remain in the filters for about ten hours. Rinsing of filters for two hours removes all traces of chlorine.

The screen filter (Seitz Hercules) of asbestos filtering material must be renewed every two to four days of operation, as determined by the filtration rate and clarity of outflow.

The functioning of the Seitz germ-proof filter is such that each of 50 sheets employed acts as an individual filter. Impairment of any one sheet may mean non-sterile water. It now becomes obvious why efforts are maintained to keep the microbial population at a minimum. Bacteriological tests are the only means of providing an answer to the question of effective operation of the filter. Another very important attendance necessary for the efficient operation of the filter is the steam sterilization of the sheets themselves. Strict adherence to certain prescribed directions must be observed.

As in the case of the germ-proof filter, so is it true with our ultra-violet units with respect to routine bacteriological tests as control measures of efficient operation.

Sirup Preparation

Quality and uniformity of sugar, color, acid and flavor in the finished carbonated beverages are directly governed by the consistency of preparations in the sirup room. Extreme regard for thorough cleanliness and sanitation of the sirup room and all equipment therein are absolute necessities.

The sirup room of our plant is located on the second floor directly above one of our bottle filling machines. It is enclosed and provided with a sterile air

filter and an exhaust fan to keep out as much dust and other air contaminants as possible. The cement floor is grooved to facilitate drainage. Nine closed 200 gal. sirup tanks, three open kettles and a Seitz germ-proof filter are conveniently placed so as to permit a minimum of piping and easy access for cleaning and steaming.

The sirup room operator begins his work one hour before bottling time. During the hour interval, all small utensils, tanks for immediate use, pipe lines and the filter are adequately steamed. Scheduled flavored sirups are made from stored concentrated sugar solutions (above 33 deg. Bé.) prepared late the previous afternoon.

In the evening the filter is backwashed, the tanks are cleaned and steamed, and hot water, above 180 deg. F., is run through all pipe lines. The floors and all working utensils are thoroughly cleaned.

Simple sirup is usually considered as sugar, usually cane sugar (sucrose), dissolved in water. Concentrations of simple sirup or amounts of sugar in a given volume are specified in degrees Baumé. Determinations of concentrations are based on Baumé reading hydrometers.

Sirups may be prepared by either the so-called "cold process" or "hot process." In the cold process, sugar is added to agitated water at about room temperature in a tank and agitation is continued until the sugar is completely dissolved. Acid, color and flavor are then added during agitation.

In the hot process, sugar is added to agitated hot water, and agitation and heat continued until 190 to 212 deg. F. is reached. Heat in this case is intended for sterilization of the sugar solution. It is obviously important to avoid microbial contamination in subsequent handling.

Table I—Sirup Making Table.

Gal. of 36 deg. Bé. sirup...	90.0	89.0	80.0	65.0	62.0	62.0	60.0	55.0
Gal. of Water.....	10.0	11.0	20.0	32.0	35.0	38.0	40.0	45.0
Deg. F. of sirup flow.....	80	80	60	60	60	60	60	60
Deg. F. Bé. at sirup temp...	32.2	33.0	30.3	26.5	25.6	24.7	24.0	22.8
Number of gallons of 36 deg. Bé. sirup at various temperatures								
Deg. F.								
45.....	89.4	88.4	79.4	67.8	64.8	61.8	59.8	54.9
50.....	0.5	0.5	0.4	0.9	0.9	0.9	0.9	0.9
55.....	0.5	0.5	0.6	0.9	0.9	0.9	0.9	0.9
60.....	0.6	0.6	0.6	68.0	65.0	62.0	60.0	55.0
65.....	0.7	0.7	0.7	0.1	0.1	0.1	0.1	0.1
70.....	0.8	0.8	0.8	0.2	0.1	0.1	0.1	0.1
75.....	0.9	0.9	0.9	0.2	0.2	0.2	0.2	0.2
80.....	90.0	89.0	80.0	0.3	0.2	0.3	0.3	0.2
85.....	0.1	0.1	0.1	0.4	0.3	0.3	0.3	0.3
90.....	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4
95.....	0.3	0.3	0.3	0.5	0.5	0.5	0.4	0.4
100.....	0.4	0.4	0.4	0.6	0.5	0.5	0.5	0.5

Our principal cane sugar supply comes in the form of concentrated sirup of 36 deg. Bé. Two thousand gallon deliveries are pumped directly from truck tanks into one of two suitably sized storage tanks located on the ground floor. Pipe lines feed the sugar solution to the sirup room as needed. The tanks are examined and flushed with hot water periodically. Incoming sugar is subjected to a number of laboratory tests, including concentrations of sugar, hydrogen-ion concentration (pH), chemical impurities, color and presence of microorganisms.

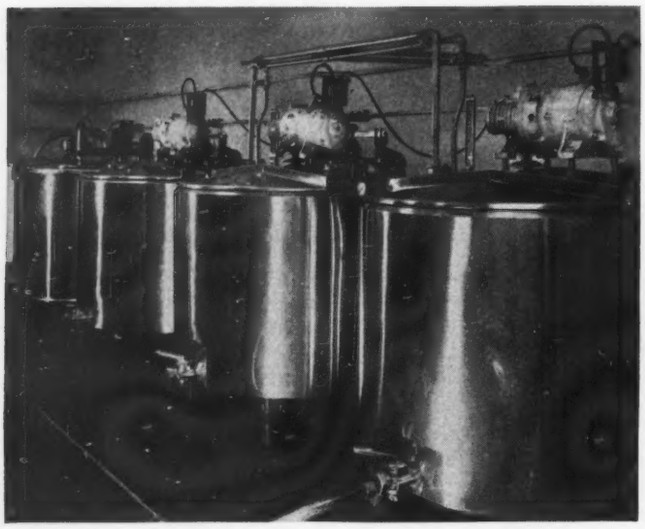
Dextrose or corn sugar in solid form is used together with cane sugar in making some of our flavors, particularly pale dry ginger ale.

In one method we employ to make sirups, a calculated quality of simple sirup sugar of 36 deg. Bé. is fed into a designated closed, jacketed, stainless steel mixing tank. It is then agitated and heated by means of steam coils to about 170 deg. F. and filtered through the germ-proof filter. The filtered sirup, followed by filtered water, is conducted into a thoroughly cleaned and steamed double-jacketed stainless steel cooling tank. The purpose of having water follow the simple sirup through the filter is to prevent the retention of any sugar. Sterile, filtered and deodorized water is then added to within about two to three gallons of the desired total volume of the mixture of simple sirup and water. The mixture is then cooled to the temperature of the called-for finished sirup flow and water added to the full volume. Calculated volumes of sugar color (caramel), acid solution and flavor are added and mixed with the sirup by agitation.

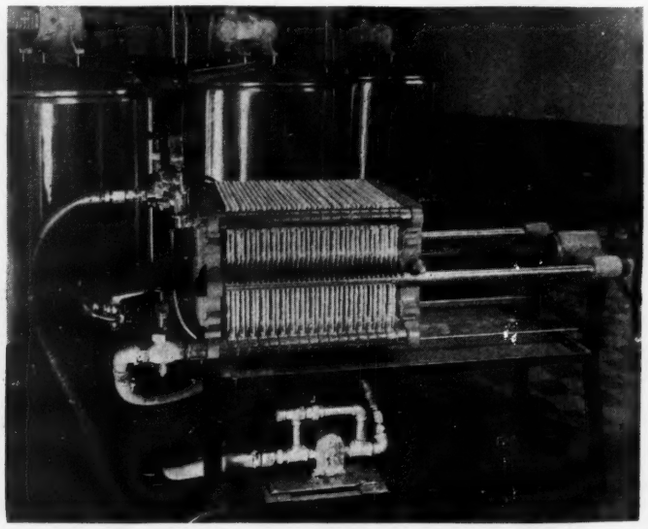
In another method, appropriate quantities of 36 deg. Bé. sirup are mixed with water and the mixture heated to boiling and then allowed to cool. When the temperature of sirup flow is reached, correct adjustments are made.

In a third method, calculated ratios

(*Turn to page 57*)



Battery of stainless steel jacketed mixing tanks used in sirup manufacture.



After processing, sirups are sterilized by passing through this filter and then flow to cooling tanks.

Pectin as Aid in Freezing Fruits*

Part I—Its application in the freezing preservation of strawberries. Pectin indicates worth as protective agent

By GEORGE L. BAKER, *Delaware Agricultural Experiment Station, Newark, Del.*

STRAWBERRIES and peaches are two of the fruits which present difficulties to the freezing industry. Strawberries have a tendency to lose juice upon thawing for consumption, and peaches turn brown due to the action of oxidase enzymes upon the tannins present. Considerable study has been made upon the protective action of substances, such as sugars and salts, which would affect the osmotic pressure and the freezing points of fruit-protective agent mixtures. While sugar and sugar sirups have been found beneficial as protective agents for fruit tissue during freezing, the value of the natural fruit jellying material, pectin, has been considered only briefly in the literature. Its application in the freezing preservation of strawberries and peaches will be discussed in parts I and II, respectively, of this article.

Research upon the use of pectin in the freezing preservation of fruits has either not been conclusive or for patent reasons has been withheld from the public. One patent to Cowgill[2] was granted in 1938 on the use of "non-acid pectin in non-hydrated, non-gelatinous condition" dispersed throughout fruit material, with or without sugar, for the purpose of aiding the freezing preservation of food materials. According to this patent, sufficient pectin should be added in the case of berries to provide the juices which leaked out "with a pectin content approximating the natural pectin content of the original material." This patent appears to be the extent of public knowledge upon the subject at this time.

For summaries of the chemical research upon the freezing preservation of fruits, the reader is referred to the reports of Diehl,[3] Magoon,[5] Birdseye and Fitzgerald,[1] and Tressler[7] presented in the symposium before the Division of Agricultural and Food Chemistry of the American Chemical Society at New Orleans in 1932; also to the book by Tressler and Evers,[8] where much valuable information and extensive bibliographies are given.

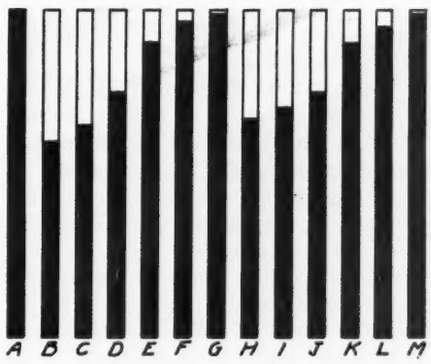


Fig. 1—Graphic representation of liquid lost (white portion of column) from frozen sliced strawberries of the Dorsett variety after exposure for two hours at 80 deg. F., when treated as follows:

A—Not frozen.
B—Frozen control.
C—Plus 0.5 parts pectin.
D—Plus 1.0 parts pectin.
E—Plus 2.0 parts pectin.
F—Plus 3.0 parts pectin.
G—Plus 5.0 parts pectin.
H—Plus 5 parts sugar.
I—Plus 20 parts sugar.
J—Plus 40 parts sugar.
K—Plus 1 part pectin and 20 parts sugar.
L—Plus 1.3 parts pectin and 20 parts sugar.
M—Plus 2 parts pectin and 20 parts sugar.

(Based on 100 parts berries.)
(The pectin used in this experiment contained 4.89 percent CH_3O.)

In addition, the studies of Woodroof[9] at the Georgia Experiment Station are of interest. He considers that freezing causes precipitation of the protoplasm within the plant cell. He has shown diagrammatically that, whereas protein components are precipitated, fruit cells containing starch grains, or cell walls containing largely carbohydrates, are apparently unaltered by freezing.

Very recently, Woodroof[10] discusses the effect of handling methods and the use of anti-browning agents in the control of surface browning of peaches. While such agents control surface browning, he concludes that internal browning, which is a result of cell injury by ice formation, may only be controlled by a high sugar sirup glaze or by rather high concentrations of acids or thiourea.

Pectin and Freezing

According to Rosa[6] the ability of plants to resist cold is dependent upon water held by colloidal absorption. Since pectin is the most important colloid present in fruit tissue, it must be considered as responsible for colloidal effects in the control of the physical state; variable effects would be expected with changes in acid or salt content. If the pectin content of the plant cell could be regulated, improvement in the freezing preservation of fruits might be expected. However, at present it is impossible to carry out any such reaction.

Pectin can be used, as Cowgill[2] finds, to form a pectin-sugar-juice sirup by combining with the sugar and such juices as may leak out of fruits before actual freezing has occurred. The literature indicates that if oxidation previous to and during freezing and the loss of water from cell tissue during freezing could be prevented, the frozen fruit, upon thawing, would have a more natural appearance. While the pectin sirup of Cowgill may help prevent oxidation, it was thought that pectin in the jellied state might accomplish both of these requirements, that is, prevent oxidation and the loss of excessive liquid from cell tissue previous to and during freezing.

A practical application for the use of pectins which form jellies without sugar is thus apparent, especially since a study† of pectin with these characteristics is in progress at the Delaware Station. These pectins which will form jellies without sugar are characterized by a low ash, a low methoxyl content, and easy dispersability in water solution. They will form firm jellies upon reaction with the salts present in certain fruit juices. Therefore, they were ex-

* Published with the approval of George L. Schuster, Director, Delaware Agricultural Experiment Station. The original title of the paper is "Pectin as an Aid to the Freezing Preservation of Strawberries and Peaches."

† The study referred to has been completed. It includes the preparation and physical properties of low-methoxyl pectins. It is hoped that a full report will be publicly available in bulletin form within the next half-year.

pected to be especially suited to form jellies with the fruit juices which leak out of berries or other fruits, before or after actual freezing took place, and form a protective coating upon the fruit. The methoxyl content appears the most important factor in determining physical behavior. While it is impossible to regulate the pectin content of the plant cell, it was thought possible to introduce pectin as an external protective agent for fruits to be used by the freezing industry. Commercial pectins in addition to the laboratory preparations were used in the freezing experiments.

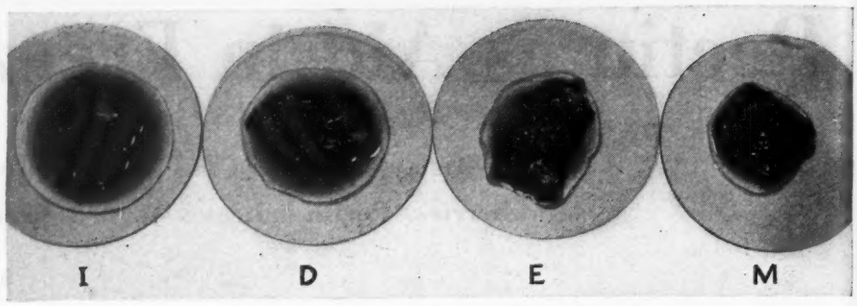


Fig. 2. Appearance of sliced strawberries shown graphically by columns *I, D, E* and *M* of Fig. 1 after exposure to a room temperature of 80 deg. F. for three hours. (Note loss of juice in sample *I*.

Experimental Conditions

The experiments which are reported here were carried out under laboratory conditions. After the fruit was treated it was frozen in the freezing compartment of a household type electric refrigerator where the temperatures could be controlled down to −10 deg. F. The treated fruit was held in the frozen state for at least 24 hours before the observations upon the effect of the treatments were made. Commercial quick-freeze equipment was not used.

Pectin Solutions

Solutions of the various pectins were used in the initial experiments upon strawberries. The methoxyl content of the laboratory preparations varied from 11 down to 3.5 percent. The pectin with the lowest methoxyl content is a product approaching pectic acid or completely demethylated pectin. The value of the low-methoxyl pectins as protective agents for the strawberries was immediately proved in these preliminary freezing experiments. The use of a cold 2-percent solution of a pure pectin having a 5-percent methoxyl content reduced the loss of juice upon thawing by one-third. Treatment with the pectin solution at temperatures below 60 deg. F. proved best. Pectins of high methoxyl content, including the commercial pectins, were of no value in reducing loss of juice from the strawberries, while all the low-ash pectins having a methoxyl content between 5.5 and 4 percent showed definite value.

Ferric chloride, copper sulphate, aluminum chloride and calcium chloride, all well-known precipitants of pectin, gave indefinite benefits when used alone in dilute solutions, or before and after treating with solutions of a low-methoxyl pectin. Best results with the salts seemed to follow the use in sequence of calcium chloride and a 2-percent, low-methoxyl, pectin solution. An excess of metallic ion, over 0.05 percent, in solution decreased the favorable effect of the salt solutions. The copper salt gave inconsistent results. Ferric chloride caused darkening.

The practical application of the use of calcium chloride in the prefreezing of fruits and vegetables has been suggested by Kertesz[4]. In no instance in these experiments upon strawberries did the use of calcium chloride, either by itself or in sequence with the low-methoxyl pectin, equal in prefreezing value the use of the pectin alone.

Buffer salts or acids, producing a change of pH, contributed little value to prefreezing treatment of strawberries.

Dipping in 50-percent sugar solutions indicated an improvement.

The practical use of solutions for treating berries in industry has its disadvantages in that in most cases it would require the use of machinery for removing excess liquids.

Treating with Powdered Pectin

Powdered pectin, mixtures of pectin and sugar, and mixtures of pectin and calcium phosphate, were dusted upon the surface of strawberries previous to freezing. Compared to untreated berries, which lost as much as 46 percent of their weight as juice upon thawing and standing 2 hours at 75 to 80 deg. F., the berries treated with a pectin of 4.89 percent methoxyl content lost only 16 percent. Mixing with sugar or calcium phosphate decreased the efficiency of the pectin.

Varietal differences proved of great importance when treating the whole berry. Some varieties required six hours of exposure after defrosting before showing the real value of the low-methoxyl pectins as protective agents. Powdered pectin upon the surface of dry berries usually detracted from their appearance, but sugar corrected this difficulty and imparted a moist and attractive appearance.

Treatment of Sliced Berries

Whereas the pectin of low methoxyl content proved its worth as a protective agent in the freezing of whole strawberries, best comparisons were made when using sliced berries. Slicing seemed to reduce the effect of possible factors such as variation of berry size and surface conditions. High-grade and low-ash pectins with a methoxyl content of about 5 percent again gave the best results. Experiments with one such pectin are reported here.

On the basis of 100 parts berries (Dorsett variety) various proportions of a 4.89 percent methoxyl pectin, of sugar, or of mixtures of the pectin and sugar, were weighed out and carefully mixed with the berries. By this procedure the easily soluble pectin and the sugar quickly united with any juices from the berry before freezing. After freezing and removal from the trays, the berries to which more than 2 parts pectin were added were found to be jellied. Three parts of the pectin produced a product with a good color and fresh appearance, despite a jellied condition. Five parts pectin definitely produced an unattractive jellied product which tended to darken as soon as thawed. The addition of 10 to 20 parts sugar delayed darkening somewhat in the products containing the larger proportions of pectin. The decrease in the amount of liquid lost upon increasing the concentration of the low-methoxyl pectin may be easily followed in Fig. 1. This figure illustrates the effect of various pre-

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1. C. Birdseye and G. A. Fitzgerald, *Industrial and Engineering Chemistry* **24**, 682, 1932.
2. W. W. Cowgill, U. S. Patent 2,137,205 (Nov, 15, 1938).
3. H. C. Diehl, *Industrial and Engineering Chemistry* **24**, 661, 1932.
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5. C. A. Magoon, *Industrial and Engineering Chemistry* **24**, 669, 1932.
6. J. T. Rosa, *University of Missouri Research Bulletin* **48**, 1921.
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8. D. K. Tressler and C. F. Evers, "The Freezing Preservation of Fruits, Fruit Juices, and Vegetables," The Avi Publishing Co., Inc., New York, 1936.
9. J. G. Woodroof, *Fruit Products Journal* **11**, No. 5, 138, 1932.
10. J. G. Woodroof, *Food Industries* **12**, No. 5, 35; No. 6, 50, 1940.

freezing treatments upon sliced strawberries of the Dorsett variety at the hard-ripe stage.

Looking at the figure it may be seen that sugar alone did not greatly improve the control values in these experiments. However, the higher concentrations of sugar, with or without pectin, appeared to accentuate the berry and thus gave an improved appearance to the product.

Mixtures of pectin and sugar produced the best results, not only when loss of juice but also when color, shape and general appearance of the sliced fruit were considered. Color was well retained by samples containing above 1 part pectin per 100 parts berry. This amount of pectin could be reduced to 0.5 parts when 5 parts of sugar were included in the mixture without detracting from the general appearance of the sliced strawberries.

By comparing the columns in the figure, it will be seen that considering only the one factor, the loss of liquid, 1 part pectin was equivalent to 40 parts sugar. It may also be seen that the mixture, 1 part pectin to 20 parts sugar, was equivalent to 2 parts pectin. It is obvious from these comparisons that the use of this type of pectin, when made available to the industry, will be practical in that it introduces no extra costs. Sugar may be required only as a sweetening agent. Preferred mixtures will be largely a matter of choice.

Fig. 2 is a photograph taken after the berries in the above experiment had been exposed to a room temperature of 80 deg. F. for 3 hours. It illustrates the appearance of the samples shown graphically by columns *I D E* and *M* of Fig. 1.

The experimental use of calcium salts in the prefreezing treatment of sliced strawberries gave negative results. Fruit treated with calcium salts did not show a definite improvement over the control samples. The use of these salts, for that matter, detracted from the value of either the low-methoxyl pectin or the mixture of sugar and this pectin. Evidently these salts combined readily with the added, low-methoxyl pectin and prevented combination of the pectin with the natural salts present in the strawberry juice. As a result, no favorable jellying action occurred.

Part II will report the results of pectin treatment of peaches for freezing.—THE EDITORS.

Quality Control in the Beverage Plant

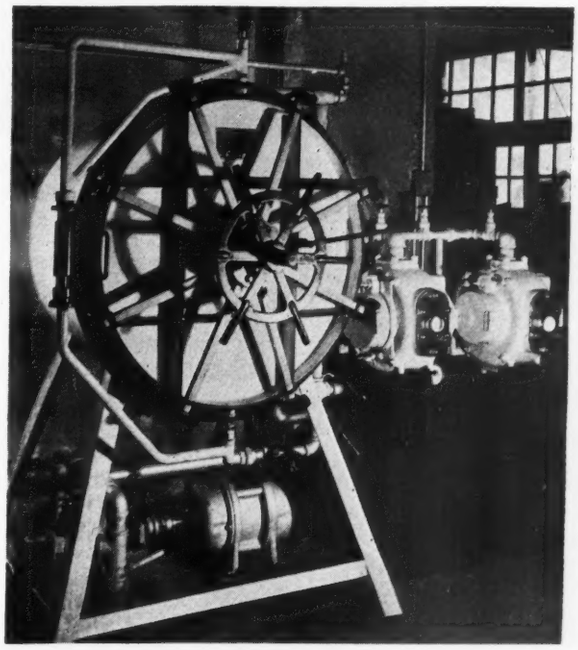
(*Continued from page 54*)

of simple sirup and water are heated to 90 to 120 deg. F. and then filtered through the germ-proof filter followed by sufficient water to wash through residual sugar on the filter sheets.

It seems apparent that the outlined procedures insure sterility. It has, nevertheless, been our experience that frequent biological tests for the presence of microorganisms, particularly test for the presence of yeasts, are necessary to check the efficiencies of the filter, the equipment and the steaming operations. However conscientious and trustworthy a sirup room operator may be, the tremendous importance of practical sterility and consistency of prepared sirups cannot be taken for granted.

A bottling plant which is engaged in the manufacture of only one or two flavors has practically no problem in the preparation of consistent sirups. In our case, we have 16 different flavors of various sugar concentrations. It is, therefore, essential that directions for the sirup room operator be as simple as possible. He has been instructed in the proper use of Baumé hydrometers, graduated in 0.1 degrees and standardized by pycnometer determinations and comparisons with United States Bureau of Standard spindles.

With the use of meter gages, it is possible to measure simple sirups with reasonable accuracy. It is well known that volumes of sirup vary with temperature. Therefore, a chart is used to guide measurements of 36 deg. Bé. sirup for preparation of various concentrated sugar solutions. This chart is shown in Table I. Calculations were computed from United States Bureau of Standards, Circular No. 375 (1929), "Weights Per United States Gallon and Weights Per Cubic Foot of Sugar Solutions."



At the left is the Seitz Hercules filter used for giving a fine polish to ingredient water, while at the right are two ultra-violet units used for sterilizing rinsing water for washed bottles.

The figures have been calculated for 60 deg. F. and 80 deg. F., temperatures used for heavy and light sirup flows.

For some particular flavors special methods of sirup preparations are employed. Discussion of such methods would not be of general interest.

Citric acid is the most frequently used acid for blending carbonated beverages. Acid solutions are made up to a 50 percent solution based on weight by dissolving 5 lb. of acid crystals in water and diluting to 1 gal. All calculations are based on such concentrations. Tartaric acid, used for grape flavor, is similarly prepared.

Caramel, or sugar color, is purchased in barrel lots and withdrawn from a bung as needed. Although the concentration is above 38 deg., periodic tests for sterility are made. Contamination of sugar color was encountered only once in our experience. Boiling under pressure eliminated all danger of contamination of sirups.

All flavor extracts purchased are carefully tested for the presence of microorganisms and observed for chemical impurities such as pectinlike precipitates and foreign matter. Flavors which do not measure up to our requirements of purity are not used. Some flavoring materials are made at the plant by an experienced extract man and others are prepared by the authors.

Part II of this article, dealing with quality control in the bottling of carbonated beverages, will appear in the February, 1941, number of FOOD INDUSTRIES.

Progress in Processing Salt Stock

Methods of processing pickles, onions, cauliflower and pepper hulls

By W. C. WORMLEY, *Mt. View, Calif.*

THE term to process as used in the pickling industry means to freshen, i.e., to reduce the salt content of brine pickles to some predetermined strength. This meaning differs materially from other industrial usage, such as in canning where it refers to the process of sterilization by heat.

In the past 40 years much progress has taken place in the methods of processing salt pickles. It is necessary to remove a part of the salt before "finishing" them or they would be inedible. The progress has been in two directions: (1) Better control; (2) greater economy of operation. Twenty years ago there was very little accurate control of the salt removal, and until the chemist came into the pickle factory the results were often far from uniform. To better appreciate the newer methods, the older ones are described first, after which the improved practice will be given in detail.

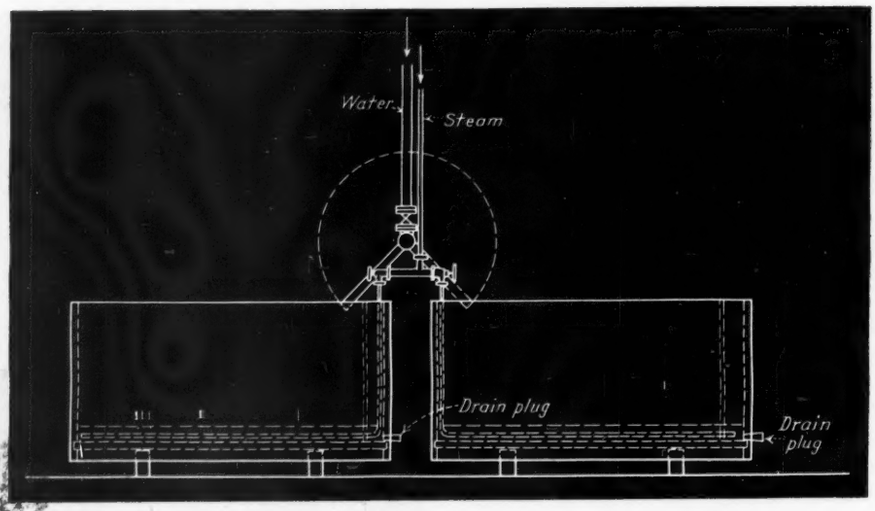


Fig. 1—In these processing tanks the water is supplied by a swing pipe. Steam pipes go to the bottom and enter through perforations in the bottom run. Pickles are protected from direct contact with steam by an inverted trough over the steam inlets.

Without Quality Control

Formerly it was the custom to build circular cypress processing tanks 8 ft. in diameter with 4 ft. staves. Such a tank would hold 10 bbl. (45-gal. bbl) or 60 bushels of salt pickles. Each process tank was provided with a steam and water supply, and a pump box containing an outlet plug. (See Fig. 3, FOOD INDUSTRIES 11, 487, 1939, for diagram of a pump box.)

The steam line (shown in Fig. 1) was ¾-in. pipe. It entered the top of the tank at one side and extended down to the bottom and across to the other side. The bottom pipe was capped. Holes ⅛ in. in diameter, ½ in. apart, were drilled in two rows in the bottom pipe. These holes were directed downward, the bottom run of the pipe being covered with a V-shaped inverted trough firmly fixed in place above the pipe. This part of the equipment was to permit heating the contents of the process tank by live steam, yet avoiding direct contact of the pickles and the steam.

A cypress paddle, 8 ft. long, was also provided for stirring the pickles during the process.

For processing cured salt stock (brine pickles), the process tank was two-thirds filled with cold fresh water. To this was added 10 bbl., or 60 bu., of salt stock (unassorted) and 2 lb. of turmeric. Care was always used to see that all brine was drained from the salt stock before dumping into the process tank.

The cypress paddle was then used (a strong man's job) to agitate the pickles in the water to permit free circulation of the water to every pickle in the tank, the agitation or stirring continuing throughout the entire process. The idea was to leach or soak out enough of the salt to leave the pickles in the proper condition for further manufacture, i.e., finishing. To aid this freshening process, the temperature of the contents of the tank was very slowly raised to 120 deg. F. by blowing live steam into the distribution pipe at the bottom of the tank. Raising the temperature must be slow—never less than 3 hours—for the slower the increase the more plump the pickles.

In actual practice the steaming would take place from 7 a.m. to 10 a.m. Between 10 a.m. and 1 p.m. the steam was turned off, but the pickles were agitated as frequently as possible. At 1 p.m. the steaming was resumed to restore the lost temperature and bring it back to 120 deg. F. Just prior to turning off the steam, 30 lb. of alum was dumped into the tank, the agitation being continued very vigorously to dissolve the alum and mix it thoroughly. Then the contents were held until the next morning, but all during the night the tank was thoroughly stirred at least once every hour.

Some may question the use of alum, but it should be recalled that this is the older practice which has been superseded by better methods.

(*Turn to page 75*)

Hints and Hurdles

Growers and Processors Cooperate In Effective Promotional Effort

THE NATIONAL LIVE STOCK AND MEAT BOARD, a nonprofit organization composed of meat packers and livestock producers is reaping the reward of cooperation between producers and processors. The method used by these two cooperating groups to create consumer understanding and favor and the method of financing promotional expenses through a self-imposed proportional tax deserve the careful study of food manufacturers.

There is an important byproduct of this type of cooperation. Producers and manufacturers working together for a common purpose learn to understand each other's problems, acquire tolerance toward annoying situations and often withhold judgment, knowing that the other side has some justification for its viewpoint. Other manufacturers might find such cooperation with producers profitable.

The most recent promotional effort of the Board climaxes several decades of efforts to correct misconceptions regarding meats, to educate the public in the values and uses of animal products and in general to create better acceptance for all meat products. The media for this promotion is a sound motion picture, "Meat and Romance." Based upon the dilemma of a bride facing the preparation of her first meal for guests, the picture is built around human-interest situations. So it sells the audience. In the course of the 40-minute film, the audience, as well as the bride, learns a lot about meat, the various cuts, their nutritional value and uses and how to cook, carve and serve them. These lessons are learned by bride and audience from the bridegroom's sister, a trained home economist, from the butcher, who knows his cuts, from the bridegroom, a physician, and from others. The education involves many facts about foods and their preparation. Above all, the film is free from the flagrant violations of good taste which tinge too many commercial promotions.

The proof of the film's worth is in its successes. It is offered free to schools, clubs of men or women, P.T.A.'s, etc. Already the film has approximately one thousand bookings, and has even been run as a feature in a New York theater.

The film is designed to instruct those who see it regarding the dietetic values of inexpensive as well as costly cuts of meat and also how to prepare them for the table. Its objective is to increase the consumption of meat—no one packer's or producer's products—just meat.

This movie will be shown before audiences aggregating as many as 3,000,000 people this coming year. It should make friends and better customers for all who are interested in the sale of meat.

Wine Made from Milk Break for Liquor Industry

THE ALCOHOLIC beverage industry, facing always the threat of another noble experiment if the zealous, articulate, hard-hitting prohibitionist ever again gets an inning at bat, may now take new heart. The alcoholic beverage industry may soon have a new ally, the dairy farmer, if the recent experiment conducted by National Dairy Products Corp. develops commercial possibilities. National Dairy has produced sherry and sauterne wines from milk. If wines from milk acquire commercial importance, the prohibitionists will have to out hit the dairy farmer, and that just isn't in the cards.

Wine from milk is not new. In fact, it is probably as ancient as the use of intoxicants. Ancient Asiatic tribes, known as Kumanes, or Kumans, made a one to two percent alcoholic beverage from mares' or camels' milk. Today, as they have for centuries, the Siberians and Caucasians ferment milk to make kefir, a 1 percent alcoholic drink. National Dairy gets more pep from milk than the ancients ever dreamed of. Its wines are 15 percent alcoholic, and a 15 percent wine can be convincing to dairy farmers in more ways than one.

Two of the characters in "Meat and Romance." The comely lady on the left is a bride who learns, along with the audience, many facts about foods—especially meat. The equally comely lady on the right, a home economist, is the teacher.

New Packages & Products

Romance of a Recipe

LITTLE could Mrs. Ruth Wakefield have realized the far-reaching effect her "Toll House" cookies, made with chopped bits of chocolate, would have on various food industries when she first developed the cookie recipe. The recipe was included in a cookbook and later broadcast on a food program in Boston. Then Peter Cailler Kohler Swiss Chocolate Co., Inc., Fulton, N. Y., manufacturer of "Nestlé's" chocolates, printed the recipe on the wrapper of its semi-sweet chocolate bar. That product, sold primarily as a confection, soon moved into the baking-chocolate department of the grocery store to pile up gratifying sales increases. Other chocolate companies placed semi-sweet bars on the market and added recipes originated in their own kitchen for the preparation of a "Toll House" type cookie.

Recently "Nestlé's" semi-sweet chocolate has been introduced on the market as semi-sweet chocolate drops—just the right size for making "Toll House" and similar cookies. These are packaged in bags, sealed at both ends and colored yellow to match the yellow of the chocolate bar wrapper. A transparent window permits inspection of the contents of the package.

Cookie bakers have placed on the market new cookies prepared according to their own commercial formulas for a chocolate-bit cookie, hoping to corral new business through the now widespread popularity of the "Toll House" type of cookies.

Just recently another new product has reached the market prepared for those who want "Toll House" or similar chocolate-bit cookies but who have not the time nor the inclination to perform the mixing operation. This is "Libby Reed's Cookie Mix," product of Prepared Foods, Inc., Chicago, a cookie mix to which is added chocolate bits and nuts for the making of this popular type of cookie.

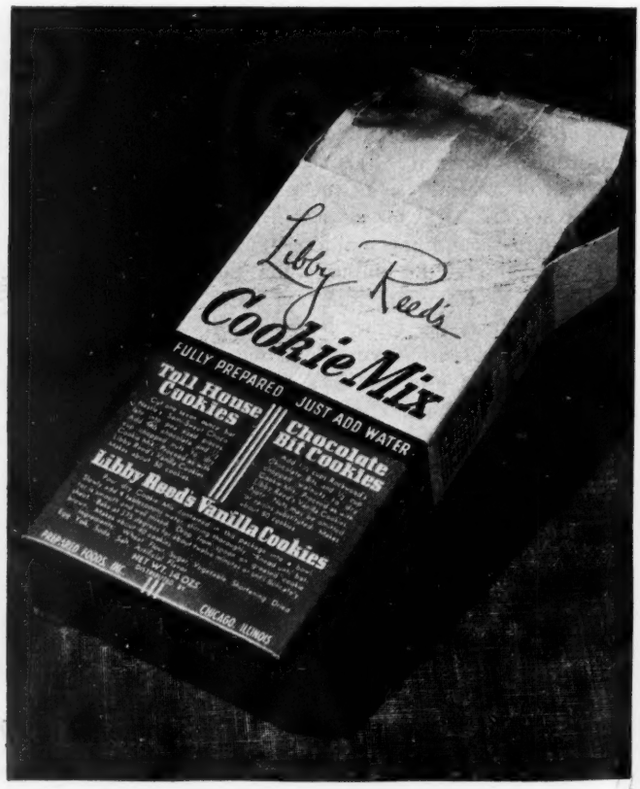
There is no denying the far-reaching effect of this recipe, originated by a home economist. It should encourage food manufacturers to greater efforts in developing worthwhile original recipes for their own products, recipes that will build sales.

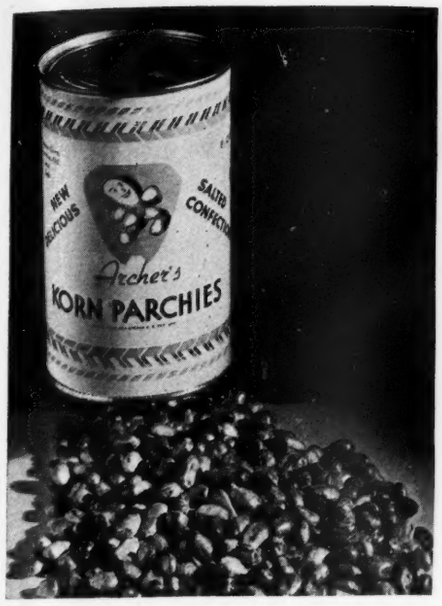
Parched-corn Appetizer

THERE seems to be no limit to the American market's capacity to absorb new manufactured food products. Particularly is this true of those products once favorites of generations back, now rarely known except in a few localities. Such a product has recently reached the market. Parched corn, a winter evening's delight, especially of farmers and of passing generations, is now manufactured and sold in cans as "Korn Parchies" by Hillbilly Korn Products Co., Spencer, Ind. The product is suggested as a cocktail appetizer and as a breakfast cereal.

"Junket" Packages Coded

THE NEW PACKAGES for "Junket" rennet powders and "Junket" freezing mixes introduce a coding system whereby the flavor of the contents can be readily identified by the homemaker at a distance and without close scrutiny of the label. In the same location on each package is a colored circle corresponding to the color of the product made with the contents. Also in the colored circle is a





large letter, the initial letter of the flavor of the contents, as *C* for chocolate, *S* for strawberry, etc. The freezing mix or rennet powder, in a satchel, is packaged in a folding carton with closing flap tightly waxed. The outside wrapper of paper-backed metal foil is also heat sealed.

Homemaker's Convenience

THE RALSTON PURINA CO., St. Louis, Mo., has recently equipped "Ralston's Wheat Cereal" package with a metal pouring spout. The spout is located on the side of the carton at the top, easily pulled out for pouring by a slight pressure of thumb or knife blade. One of the types of food containers homemakers are reported to criticize most is the folding carton whose contents is not consumed at the time the package is opened. Homemakers often report difficulty in removing portions of the contents without spilling. They also criticize because of the fact that this type of package must remain for a period of time on the pantry shelf, untidy in appearance and collecting dust.

The pouring spout on the "Ralston Wheat Cereal" package answers the criticisms. The package itself need never be opened.

It's De-Lovely

"IT'S DE-LOVELY," a 10-cent individual or single-serving-size chicken pie, ready to eat cold—or hot by simply heating in the oven—is the product of It's De-Lovely Pie Co., Dorchester, Mass. This product, packaged in a transparent bag and sold through grocery stores in the Greater Boston area, has built for itself a substantial local market, both as a ready-to-serve item and also as an item in school children's or workers' lunches.

Trucking Improved Three Ways

Bigger capacity, easier loading, less damage in factory-to-store hauling of fragile foods

INCREASED carrying capacity, ease of loading and unloading and less damage to fancy bakery goods in transit are the three outstanding features of a new type of motor tractor-trailer designed for bakery-to-store distribution by DeWitt C. Creiger, chief engineer of Heinemann's Bakeries, Inc., Chicago.

The new type of unit carries 35 special shipping cases, as compared with the 20 cases previously carried in the company's conventional 1½-ton trucks since it began operations back in 1935 when it had three retail stores.

On December 27, 1937, the company met its increased truck capacity needs by putting into operation the first of the new tractor-trailer units. At present the company's stores have increased to ten in number and its new distribution units to three, with a fourth on order.

Because the longest body which can be mounted on a conventional, two-axle, 1½-ton truck of standard wheelbase is 12 to 14 ft. long, the increased carrying capacity of the new unit is obtained by the ability of the tractor-trailer with its three axles to mount a body 20½ ft. long. It is this additional 6½ or 8½ ft. in body length, with the same width and height, which permits the cases of baked goods carried to be increased from 20 to 35.

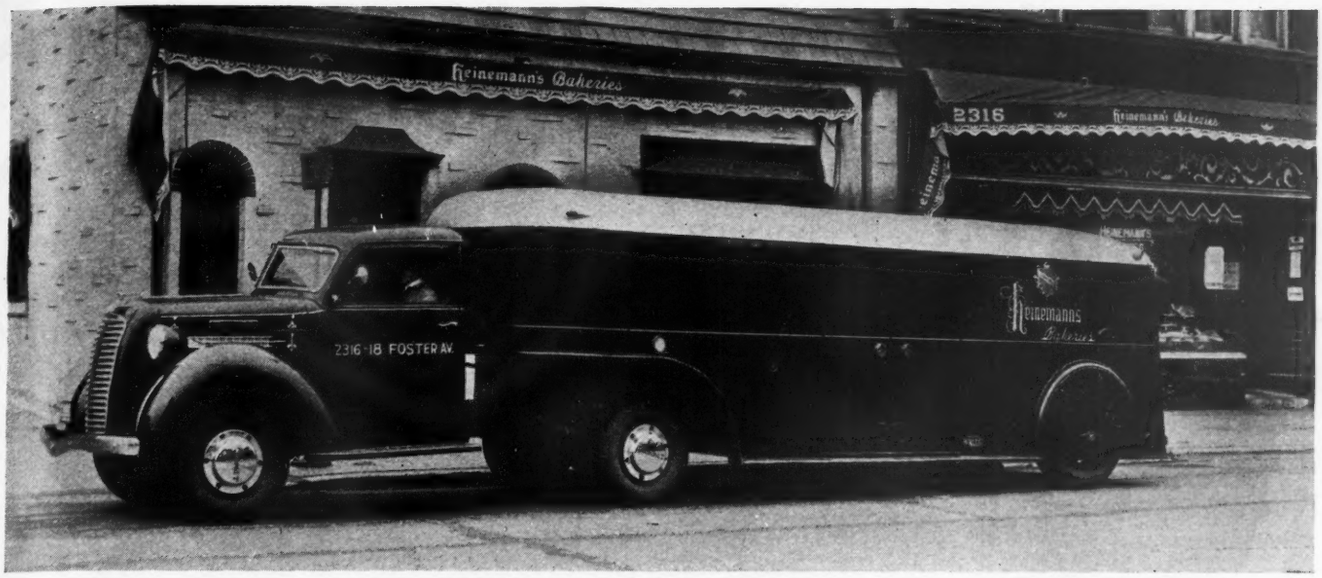
But the adoption of the tractor-trailer has made possible another important advantage, namely a low floor in the trailer to eliminate the lifting of the empty as well as the loaded shipping cases. Because of the absence of any power-transmitting parts underneath the trailer floor back of the fifth-wheel by means of which it is connected to the tractor, the trailer frame is dropped to give a trailer floor only 14 in. above the street level. This is the same height as the loading platform at the bakery.

At the points of unloading at the ten retail stores, the curb or sidewalk height is approximately 8 in. above the street level. With a trailer floor 14 in. above the street level, this leaves 6 in. between the floor and the sidewalk.

The above 6-in. difference in height is made up by steel drop gates with 6-in. legs at the outer corners, as shown in one of the accompanying illustrations. These drop gates are fitted into each of the two trailer side doors (one on each side of the body) and also at the rear end of the trailer; the trailer has double rear doors that open for the entire width of the body.

When the rear drop gate is lowered, its rear outer edge is 6 in. above the street. When either side-door drop gate is lowered onto the sidewalk, its outer edge is 6 in. above the sidewalk. This is the same height as the wheeled dollies onto which the loaded cases are slid for delivery into the stores. As a result, no lifting of the loaded cases is necessary to get them onto the dollies, an appreciable advantage.

Without lifting, two cases at a time are slid out across a steel drop gate from the rear of the special drop-frame Highway trailer used by Heinemann's Bakeries, Inc., Chicago, to transfer its line of bakery items from its plant to ten retail stores. From the drop gate, the cases are slid onto dollies rolled into the stores. Similar drop gates are provided at both side doors.



With its trailer floor only 14 in. above the street, this low, sleek-looking Diamond-T tractor and highway drop-frame trailer carry 35 cases of bakery goods. The cases are handled without lifting between the Heinemann bakery and its retail stores, one of which is shown in the background. The trailer is insulated with 2 in. of "Dry-Zero" and has 4½-ft. doors on each side. The trailer body, tractor cab and hood are painted with No. 95,053 Du Pont green. The trailer roof is done in aluminum. Conventional 1½-ton trucks previously employed carried only 20 cases of goods per load.

Once on the dollies, the latter are rolled into the stores where the cases are slid off onto portable ramps of the proper height to make any lifting or tilting of the cases unnecessary. This method of unloading the bakery products has resulted in an almost complete elimination of damaged or crushed goods. This was previously quite considerable.

In getting the empty cases back into the trailer, the reverse operation is followed. They are loaded onto dollies from ramps and from the dollies slid onto one of the drop gates and into position in the trailer body.

Each of the trailers is loaded in such a way that the entire load can be taken out and the empties replaced without any shifting or rearrangement of the load for a second store. At least two stores are serviced on each trip with a trailer.

Sometimes three stores are serviced on one trip. When this is done, the load for each store is grouped adjacent to the side or rear opening which will be most convenient for that store.

While at the bakery all the cases are loaded into the trailer through the rear door, at the delivery end they may be unloaded through any of the three door openings. Some of the deliveries are made from alleys, some from private property and some across the public sidewalks. This is the reason why a door has been fitted on the left side of the body as well as on the right side and in the rear.

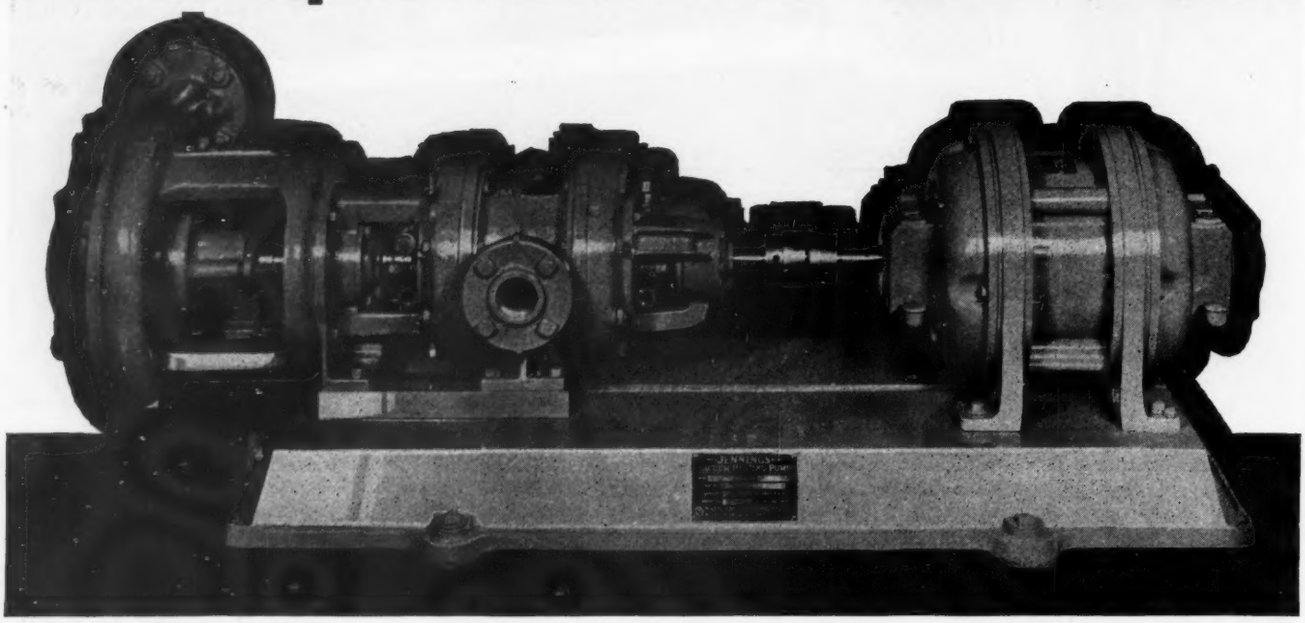
The inside length of the trailer is 20½ ft.; its width is 7½ ft.; and its height sufficient to accommodate a stack of two of the shipping cases. These are of a special design, with one hinged side which may be folded back on top of the case. This gives access to the inside of the case.

The bakery items, including a general line of bread, rolls, cakes, pies, cookies, candies and other sweet goods, are loaded at the plant onto metal trays which are slid into the open side of the case and held in position on rack supports. The trays in place, the hinged side is swung down into position to close the case for its ride to the retail store. Leather strap handles on each end of the case are provided for convenience in sliding it on and off the unloading dollies.

To protect the goods and help maintain flavor and freshness in winter or summer, the entire body (roof, sides and ends) is insulated with a 2-in. layer of "Dry-Zero."

Two of the special Heinemann shipping cases at the bakery, showing how the various items are carried in metal trays supported on inside rack supports. Note also the hinged sides folded back on top of each case for easy loading but later swung down into position to close the case for its trip between plant and store.

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

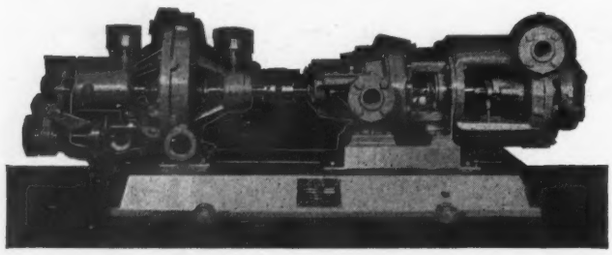


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.



THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

The Food Industry News

GENERAL NEWS, BUSINESS TRENDS, MEN, JOBS AND COMPANIES • JANUARY, 1941

Army To Buy Food In Small Tin Cans

Prefers No. 10 can but changes requirements so as to avoid speculation in larger size

AN ARMY expanded to four times its size can't be fed from No. 10 size canned foods after the season's pack has been sealed up in cans of nearly normal market division. In a nutshell, that's the answer to the decision of the Quartermaster General to open bidding on Army canned goods to No. 2 and No. 2½ size cans.

Loosening of the specifications was agreed upon to prevent speculation in large-size cans, but the action doesn't mean that the Army is anxious to stock up with store-sizes of fruits and vegetables. The opposite, in fact, is the case, and efforts will be made to stimulate increased pack of No. 10 size during next season's operations.

There are twin reasons for this: Because No. 10's are easier to handle and less work to prepare, and because they will save on tin. It is readily agreed, however, that stimulation of No. 10 pack can easily be carried too far. Based upon the Army ration of 18 oz. of vegetables a day and calculated on the basis of canned vegetables four times a week, 1,200,000 men will require roughly 8,000,000 cases of No. 10's a year.

The National Canners' Association gets a large share of the credit for spotting the looming difficulty in Army buying limited to No. 10 size from the current year's stocks. They supplied figures showing, for instance, that the No. 10 pea pack this year was 7.3 percent, compared to 6.8 percent in 1938 and 6.5 percent last year.

Sets Up Half-pay Pension

AMERICAN MAIZE PRODUCTS CORP., New York, has established an employee retirement pension plan, effective December 31, 1940. This plan, in conjunction with Social Security benefits, will provide retirement on income levels approaching half-pay for employees reaching the age of 65. The plan operates on a cooperative basis, with the company contributing dollar for dollar with the employees.

GETS DEFENSE JOB

John L. Baxter, president of H. C. Baxter & Bros. Canning Co., Brunswick, Me., has been appointed liaison between the Quartermaster Corps and the canning industry. He will develop Army subsistence specifications which more closely meet commercial practices, stimulating direct bidding on Army procurement requirements. He also will aid in developing an inspection service at canning factories to provide closer contact and wider understanding of Army specifications.

Cheese Imports Decline; Chance for New Industry

IMPORTS of foreign types of cheese have been much less than normal during 1940. During the first ten months imports declined to 28 million pounds, compared with 49 million pounds in the corresponding period of 1939. Much of the decline was in Swiss cheese (7 million pounds) and Canadian cheddar (5 million pounds), the latter because Canadian cheese has gone to England. But many special foreign varieties like Edam and Gouda from Holland, Roquefort from France and others cannot reach the United States under present conditions.

Certain American cheese makers are being urged to take up the manufacture of foreign types of cheese under carefully controlled conditions. It is hoped that they may be able to fill the normal market, and perhaps hold it permanently if they do a good job in the making of these specialties.

Butter Institute Works on Quality

Practical plan of quality cream production being developed by ABI research committee

MANAGEMENT and quality control problems dominated the program of the 32nd annual meeting of American Butter Institute, held in Chicago, December 3 and 4. Representatives of more than 130 companies operating as many as 600 butter-making plants were in attendance.

President Frank Pilley, Frank Pilley & Sons, Omaha, Neb., cited increased labor costs, taxes, materials and supply costs and distribution expenses as being responsible for the present-day narrow margin of profit.

Executive Secretary Dr. N. W. Hepburn focused attention upon legislation affecting the butter-making industry. Labeling requirements to comply with the Federal Food, Drug and Cosmetic Act are under study with the hope of ironing out the troublesome wrinkles.

Adoption of the Wildman mold mycelia count as the basis for determining the fitness of cream for butter-making intensifies the importance of the cream quality improvement program. Condemnation and seizures of butter based on this microscopic test put the average butter manufacturer at a disadvantage because, at the present time, the buying stations do not have a ready test to disclose the presence of mold in the cream.

Under the guidance of the Institute's Research Committee a practical program of quality cream production is being worked out. A modification of the Wildman test is being studied and a procedure for handling cream on the farm is being developed to the end that farmers will be encouraged to produce mold-free cream. Even the type of cream-holding container for farm use is being studied.

Canada Bans U. S. Foods

PREPARED cereal foods, processed and canned fruits and vegetables, preserved fish, oysters, crabs, and spirits and wines are banned from importation into Canada from the United States and

other countries outside the sterling bloc, according to recent restrictions that have been laid down by the government in Ottawa. This move has been taken to conserve foreign exchange for war essentials. Fresh vegetables, grapefruit juice and certain dried fruits such as raisins, currants, dates and apricots are not affected by the embargo.

Walsh-Healey Exemption May Be Asked for Canners

Defense Commission expected to appeal to the Labor Board

A REQUEST to the Labor Department from the Defense Commission's purchase coordinator's office for seasonal exemption to perishable food canners from provisions of the Walsh-Healey Act appeared likely to materialize late in December. The move was being considered as one phase of the new Army procurement policies of buying as much food as possible direct from processors.

The plan under consideration involves no "breakdown" of the Walsh-Healey standards and would have only a limited application during the short seasonal pack rush. Any such exemption probably would parallel the statutory 14-week exemption granted perishable food canners under the wage-hour law.

Douglas C. MacKeachie, defense food purchase coordinator, feels that Walsh-Healey presents more "mental hazards" to canners than actual ones. He also believes that most of the reasons canners have used to explain their reluctance to bid on Government purchases because of Walsh-Healey were ironed out at conferences held in Washington during December.

Red Cross Sends Food To Prisoners in Europe

MASS food package distribution among European war prisoners was inaugurated by the American Red Cross during December. At least 5,000 packages were sent, at the outset of the program, for distribution equally among Polish, Belgian, French and British prisoners in German camps.

These standard packages contain evaporated milk, oatmeal, cheese, sardines, oleomargarine, dried fruit, corned beef, orange juice, sugar, and vitaminized dry beverages needing only water. Each package weighs 11 lb. The food items, as determined by the Nutrition Service of the Red Cross in cooperation with the Army and Navy quartermaster and supply units, are purchased in bulk, packed by a merchandising firm.

Safe delivery of the packages is guaranteed by the International Red Cross.

Army Buying Falls Into Step With Food Industry Practice

Procurement policies being overhauled to provide centralized mass buying, direct purchases and inspection at source

FOOD PROCUREMENT policies for the nation's vastly expanded Army are undergoing a sweeping overhauling designed to streamline operations and more closely align them to normal commercial practices. Chief objectives of the revised program are centralized and mass-quantity buying, direct buying from processors and manufacturers, and Government inspection at the source.

The first, and over-all most important, result of this new arrangement was establishment in December of three Quartermaster Corps central buying offices. These will handle all food procurement (except perishables available at local markets) for the "issue commissary," as distinct from the post sales commissaries for officers' and enlisted men's "extras" which deal largely in brand-name commodities in small quantities. These central buying offices and their assignments are:

San Francisco—procurement of West Coast products, including canned fruit and canned salmon.

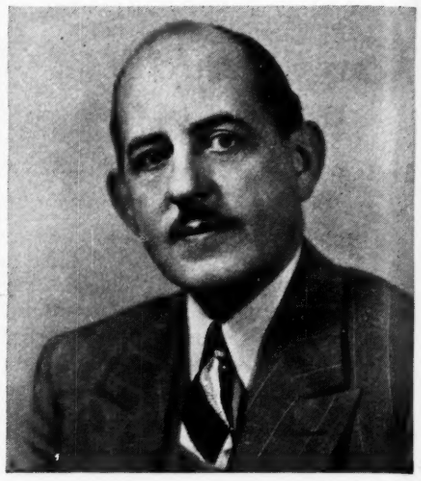
Chicago—procurement of all canned meats, vegetables and flour.

New York—procurement of coffee, tea, sugar, spices, preserves and most other manufactured food items.

These offices will receive requisitions from the various Army Corps Areas, contract for these requirements and arrange for shipments against these contracts. Purchases, wherever possible, will be in carload lots, although emphasis also will be placed upon insuring that everyone who wants a share in the Army business can get it and upon keeping disruptions to civilian trade and prices at a minimum.

The second move has been to set up general plans for procurement of various types of commodities, giving consideration to the individual problems of each. For this, industry representatives are being consulted, asked to submit suggestions and to assign men to Washington as liaison with the QMC. Canned foods was the first problem tackled, and the methods adopted point the way for other food fields.

The National Canners Association was asked to call together a committee to point out divergences from commercial practices which might hinder some or all canners from selling to the Government. As a result, work is being pushed to simplify and standardize specifications more nearly along commercial lines. It is expected, for example, that the standard commercial discount and standard allowance for "swells" will be incorporated in the Government specifications to put all bidders on an equal footing.



Harris & Ewing

DOUGLAS MacKEACHIE

It was decided that canned foods bidding would operate more smoothly on a delivered price basis, rather than on the f.o.b. factory policy the QMC instituted last summer for optional use. There likely will be exceptions, however, and such things as West Coast fruits may be put on an f.o.b. factory basis. To make it easier to calculate shipping charges, the QMC and National Canners Assn. are working out detailed freight rate schedules to the various delivery points.

The effect of provisions in regard to performance bonds on canners' selling to the Government also is being studied. The general policy of providing Government inspection and acceptance at the source instead of at destination is being worked out for the purchasing of canned foods.

There is a probability that the defense coordinator's office will ask the Department of Labor to grant a seasonal exemption to canners from provisions of the Walsh-Healey Act.

The man in direct charge of this streamlining of Army food procurement is Douglas C. MacKeachie who was called from his post of purchasing director for the Great Atlantic & Pacific Tea Co. to be assistant coordinator of defense purchases in the office of Donald M. Nelson. He will have working on his staff representatives of the various major food industries.

Two Standards Started; Action Taken on Others

CANNED fruit cocktail will be the subject of a new docket for which hearings will begin January 13. Proposed standards of identity, quality and fill of container were printed in the December 11 *Federal Register*. M. F. Markel will be presiding officer.

A hearing has also been announced to amend the standard of quality for canned peaches, pears and apricots. This hearing, with Mr. Markel as presiding officer, will commence on January 16. The proposal is that the canned fruits bear the general statement of substandard quality when the form of the fruit is mixed pieces of irregular sizes and shapes. This proposal is also in the December 11 *Federal Register*.

After a brief recess the oleomargarine hearing was continued for two days on November 26 and 27. A compromise of 1 percent emulsifying agent was agreed upon by industry representatives, with the exception of a product intended for certain baking uses. Request for permissible use of mono- and di-glycerides was also made, but no factual evidence was submitted. Briefs are due on this docket by January 6.

The chocolate products hearing, which began on December 9, is described in considerable detail in another story in the news pages of this issue.

Fair Trade Acts Have Failed Grocery Manufacturers Told

AGMA counsel would outlaw "unfair brand manipulation." Record year predicted for 1941. Advice on packages

FAIR-TRADE acts have failed to correct the below-cost selling problem. That is what Charles Wesley Dunn, AGMA counsel, told members of the grocery industry who attended the recent annual convention of Associated Grocery Manufacturers of America in New York. Although these acts have set a floor price which is a natural economic one, they are subject to practical objections, he said.

Mr. Dunn proposed outlawing of "unfair brand manipulation" by large retailers of food products for the protection of the manufacturers' property right through Federal and State legislation. The manufacturer must meet private brand competition on a strictly economic basis, and stand or fall accordingly, Mr. Dunn explained. But, he emphasized, "the decisive fact remains that no retailer has the legal right to misuse channels of distribution which he controls by unfairly conducting his private brand business in derogation of the public policy declared by the anti-trust law."

Another outstanding speaker at the meeting was B. C. Forbes, editor and business columnist. He told the manufacturers that production will break all records in 1941. He also said that the time had come for business to stick its neck out to the extent of telling its story frankly, lucidly and repeatedly to the American people so that we can not much longer be accused of being a nation of economic illiterates.

Advice on packaging was given at the meeting by James Harley Nash. Improved package designs, he said, stimulate the sales force and through them affect dealers and consumers. "The redesigned package must be new, dramatic and have public acceptance to gain the full results of the expenditure," he said. "There has been no problem of holding old customers, and in every instance we have definitely attracted new customers."

Dr. Gallup Tells How To Increase Dairy Sales

"THE DAIRY INDUSTRY has a very good reputation—it is well thought of by the vast majority of the people of the country." So said Dr. George Gallup, the expert on public opinion, at the 22nd annual meeting of National Dairy Council, which was held in Chicago on December 4.

But even so, there's promotion work to be done by the dairy industry. Referring to a study made for the Department of Agriculture, Dr. Gallup reported that: "We found in this study, which we made on a nation-wide basis, that only half of all the adults in the United States had drunk any milk on the day before the survey."

Dr. Gallup told the dairy industry that its problem is increasingly one of selling the older people, particularly beginning with the high school age. He also recommended that a specific plan of education for each family be worked out by the route salesman. An analysis of each family and the amount of dairy products they should consume to measure up to dietary standards should be clearly explained to them. Each family needs reminding and needs to be shown what to do to meet the need. He said that a lot of advertising fails because, after selling the people, it stops short of telling them what they should do about it.

Harris & Ewing

PLAN HEMISPHERE DAIRY COMMITTEE

Representatives of 16 American republics and Canada met at Washington on December 6 to discuss the organization of a permanent Western Hemisphere Committee for the dairy industries. Initiated by Dairy Industries Supply Association, the idea was first discussed at the dairy convention in Atlantic City last October. Left to right in the picture are Dr. Leo S. Rowe, director of Pan American Union; Adrian Recinos, minister of Guatemala; Harry L. Miller, president of Dairy Industries Supply Association; Luis Rodriguez, minister of Costa Rica; and Earl N. Bressman, assistant director, office of foreign agricultural relations, U. S. Department of Agriculture.

Need for a Fortified Flour Cited at Meeting of Millers

Food technologist and nutrition expert testify as to white flour's shortcomings and to the inadequacy of the diet

As a climax to practically a 90-day intensive period of regional and executive committee meetings and Federal public hearings on standards of indentity for flours, the Millers' National Federation made vitamins in flour the main subject of discussion at its special industry meeting in St. Louis on December 4. At this meeting, 225 millers from 19 states, and more than 50 non-millers, were brought up-to-date on the position taken by MNF's committee on definitions and standards before the Federal public hearing which reconvened on Nov. 12.

Dr. C. H. Bailey, Minnesota Agricultural Experiment Station, discussed the wheat kernel and its nutritional properties in respect to the human dietary. He pointed out that in the milling of the wheat kernel to get white flour, the wheat germ, along with other portions of the kernel containing the desired vitamins and mineral, is largely removed. Such is the case when the flour produced represents only about 70 percent of the wheat milled. If the flour produced represents about 80 percent of the wheat ground, the vitamin B_1 and B_2 content is practically doubled. But the bread made from such flour is no longer so pleasing in color, and it begins to fail to find its way into the stomachs of those most in need of its nutritive values.

Dr. Bailey cautioned against hasty or ill-considered action in making wheat flour the carrier of the vitamins and mineral deficiencies in the human diet. He endorsed the procedure being followed by the flour milling industry as one which would presently give rise to the most nutritionally adequate and acceptable type of bread ever made available to a mass public.

Dr. W. H. Sebrell, head of National Health Institute, outlined the nutritionists' and government's public health program viewpoint. He stated that the people of the U.S.A. get an adequate supply of calories in their food but that more than a third, the well-to-do included, are not receiving adequate dietary values in respect to vitamins and minerals.

Pellagra, nicotinic acid or vitamin B_6 deficiency, is ranked first in importance as a vitamin deficiency disease. Beri-beri, thiamin or vitamin B_1 deficiency, is ranked second. Riboflavin or vitamin B_2 deficiency is ranked third, with iron and calcium deficiency playing an important role. Iron deficiency is particularly prevalent along the Atlantic Seacoast, where the soil is poor in iron and the foodstuffs grown in it are deficient in iron. Dr. Sebrell cites the high refinement of flour, sugar and fats as contributing to the trend towards vitamin and mineral deficiencies.

He regards medication in the form of capsules, tablets and the like as not being the desired method of procedure. Addition of the desired vitamins and minerals to some commonly consumed food like flour seems to be preferred. Since flour constitutes about one-fourth of the daily calorie food intake, he holds that at least one-fourth of the vitamin and mineral nutritional intake should be in flour. Eighty to eighty-five percent extraction flour gives the desired nutritional values but has not been made available.

C. M. Hardenbergh, of Commander Larabee Corp., chairman of the Federations' committee on definitions and standards, outlined the flour milling industry's position on vitamin and mineral addition to flour and the recommendations made to the FDA.

He set forth that the proposed new flour should: (1) Be practical for all mills to make; (2) be acceptable to the consuming public; (3) have as near as possible the nutritional properties recommended by the nutritionists; and (4) have the regular optional ingredients such as bleaching agents, potassium bromate, malted barley flour and such as now permitted in commercial white flour.

"Vimin flour" was recommended as the identifying name of the new flour, this product to be made by the miller from those flours into which the added nutrients can best be incorporated and which can be marketed the most advantageously.

Because the supply of riboflavin (vitamin B_2) is so limited and the price high, it along with iron, nicotinic acid, vitamin D and calcium, was put on the optional list of nutrients which might be added to "Vimin" flour when conditions permit. Knowledge of what iron compound and how much, as well as of nicotinic acid, vitamin D and calcium, was cited as reason for placing them on the optional list.

Addition of thiamin (vitamin B_1) to give the flour a minimum content of 1.66 mg. per pound of flour was definitely recommended.

Prisoners To Learn Canning

To give employment to inmates and, more importantly, to provide training for men during their prison term, the Bureau of Prisons is planning to install a small cannery at the McNeil Island, Washington, Federal penitentiary. The small amount of products made at such a plant is generally used at nearby government institutions. None of the product enters customary channels of trade.

"There's a lady outside wants to borrow your recipe for chicken-soup!"

$400 Million Asked To Finance Stamps

Study indicates that low-income consumers, farmers and dealers would benefit

THE Department of Agriculture has reported a study of the food stamp plan. "The study here reported shows that the farmers, low-income consumers and food dealers would all benefit substantially from an expansion. . . the cost to the Federal Treasury would be about 400 million dollars a year."

The report which states this sweeping conclusion goes on to explain the objectives and theory of the plan. It points out that as of July, 1940, there were 83 areas with a total of about 1,500,000 consumer participants being served. The experience reported shows 75 percent participation by eligible consumers. Up to December 15, 1939, about one-fourth of the stamps was used for butter, one-fourth for eggs, and the balance for cereal products, fruits and vegetables. When pork was added, it cut heavily into the purchases of butter, eggs and lard.

Important improvement in dietary standards is claimed, with direct benefit to merchants, as well as to consumers. General public acceptance and support is reported.

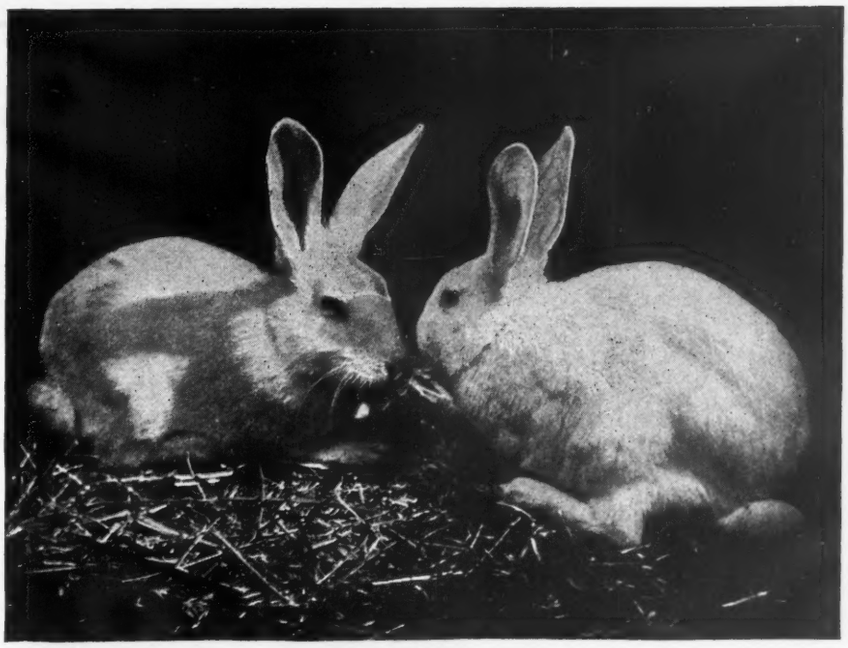
In recommending the $400 million program, the economists assume 75 percent participation of 20 million persons believed needing, or eligible for, public assistance with respect to food. If the plan were extended further to those urban families with regular income amounting to less than $1,000 per year, an additional $200 to $400 million per year would be needed. The present recommendation does not contemplate this supplement immediately.

The report gives negligible attention to the problem of substitution of surplus goods for normal types of manufactured foods, so far as the manufacturers' problems are concerned.

Genealogy

In order to make it a matter of annual record, this statement is published every January:

FOOD INDUSTRIES was founded in 1928 by McGraw-Hill Publishing Co. Dr. H. C. Parmelee was its first editor. Dr. L. V. Burton succeeded him and is its present editor. Associated with him are: E. S. Stateler, associate editor (now located in the Chicago office); G. L. Montgomery, associate editor; F. K. Lawler, managing editor; Ivan C. Miller, distribution editor; R. S. McBride, editorial representative in Washington; and Earle Mauldin, editorial representative in Atlanta, Ga.



"We'll just wait here

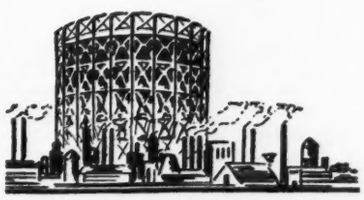
...TILL WE OUTNUMBER THEM"

Industrial strategy of the highest order, plus the selfless toil of aroused freemen, will enable America to outnumber in kind the weapons that threaten her. It will be done because it *must* be done.

And today, as always, food is the first line of defense. The side that hungers first, weakens first.

To us it is a matter of pride that America's greatest food plants are turning to Kemp in ever increasing numbers for the roasting, toasting, baking and can-making equipment that will help them achieve the ultimate in production.

For the Kemp Industrial Carburetor which completely premixes gas and air and Kemp combustion equipment go far beyond mere fuel saving. They speed heating operations and maintain a degree of control hitherto unheard of . . . that will cut your rejects to a new low.



This is a subject of fascinating interest and timely worth. For descriptive folders or specific information, address **The C. M. Kemp Mfg. Company, 405 E. Oliver St., Baltimore, Md.**

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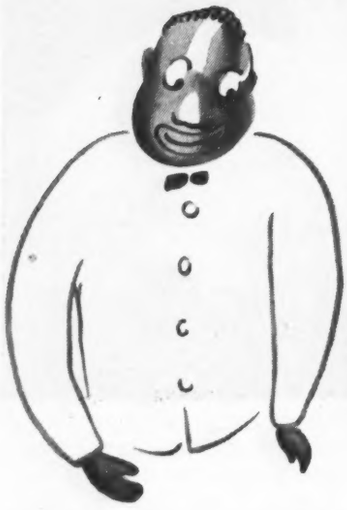

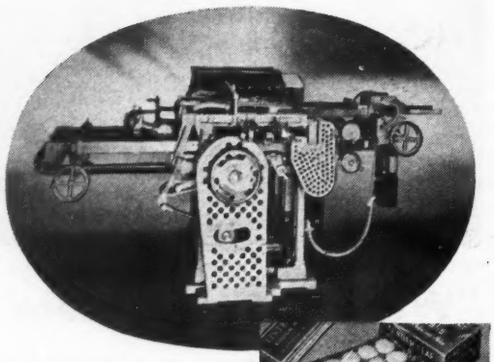

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Problems Discussed At Chocolate Hearing

Industry and government agree in general on most points

DEVELOPMENTS at the chocolate products hearing which began December 9 revealed that the industry and the government were in general agreement on most points. The government evidence supporting the proposed standards was presented under the direction of Mr. J. W. Sale, chief of the beverage section of the Food and Drug Administration. Principal witness for the Association of Cocoa and Chocolate Manufacturers was Dr. Frank C. Gephart.

The following fundamental points at issue were discussed at some length:

1. The minimum percentage of chocolate liquor permitted in milk chocolate was proposed as 10 percent by the government and for sweet chocolate as 15 percent. The Association felt that these limits were too high and suggested that 5 percent be the minimum figure in both cases.

2. The government's proposed ratio of milk fat to non-fat milk solids was also claimed to be quite at variance with customary practice over a period of years. The ratio proposed was 1 to 2.275, compared with the prevailing practice of 1 to 2.88. The industry representatives claimed that the proposed ratio would call for a richer milk than now used, would increase the manufacturing cost, and would materially change the flavor of their products.

3. The government proposed that three different kinds of cocoa be standardized: breakfast cocoa, with cacao fat 22 percent or higher; medium-fat cocoa, with cacao fat between 10 per-

SCHEDULE OF EVENTS

JANUARY

8–10—Northwest Canners Association, Hotel Multnomah, Portland, Ore.
14—Southeastern Millers Association, Brown Hotel, Louisville, Ky.
15–16—New England Association of Ice Cream Manufacturers, Copley Plaza Hotel, Boston, Mass.
18–25—National Food Brokers Association, Palmer House, Chicago.
19 (week of)—National Canners Association, Stevens Hotel, Chicago.
19–24—Canning Machinery & Supplies Association, Stevens Hotel, Chicago.
19–21—Potomac States Bakers Association, Lord Baltimore Hotel, Baltimore, Md.
20–21—National Preservers Association, Morrison Hotel, Chicago.
22—Evaporated Milk Association, Chicago.
22—National Pickle Packers Association, Palmer House, Chicago.
20–22—14th Annual Dairy Manufacturing Short Course, Agricultural and Mechanical College of Texas, College Station, Tex.

FEBRUARY

15–22—Annual Cherry Week.
18–20—Technical School for Pickle and Kraut Packers, Michigan State College, East Lansing, Mich.
28–March 7—Canned Salmon Week.

cent and 22 percent; and low-fat cocoa between 1½ percent and 10 percent. Any product containing less cacao fat then 1½ percent should be termed defatted cocoa, but no standard was proposed for this product. The industry felt that the borderline between low-fat cocoa and medium-fat cocoa should be fixed at 7 percent rather than at 10 percent, to include a considerable amount of cocoa now on the market in the range 7 to 10 percent, which should be called a medium-fat cocoa. Very little market was said to exist for a product between 1½ percent and 7 percent cacao fat.

4. The use of fats other than cacao fat, mixed with cocoa and sweet chocolate, came in for a lengthy discussion. Some comments were to the effect that the use of any such other fat would produce an "imitation" cocoa or chocolate product, for which standards should not be proposed at the same time as the "genuine" product. However, no formal action to delete the two offending sections from the docket was anticipated.

Exports to Britain May Require Credit

Sales of foods to England seen needed to move surplus and prevent loss of the market

SALE of American agricultural commodities to Great Britain may depend upon extension of credit to that nation by the United States if the war continues much longer. This opinion was voiced by J. B. Hutson, deputy commissioner of agriculture. National Advisory Defense Commission, at the convention of the National Association of County Agricultural Agents in Chicago last month.

Mr. Hutson pointed out that the United Kingdom has purchased agricultural commodities in the United States totaling $200,000,000 annually. Last July, Britain announced it would cut these purchases to $84,000,000—actual shipments have been even less than that.

This change, the speaker said, has been due to British need for conserving dollar exchange, favoring of Empire markets, the blockade, etc. The United States, however, he argued, is "vitally interested" in preserving British markets to move some of our agricultural surpluses "as well as to prevent a permanent loss of the market through changes in tastes and buying channels."

While Mr. Hutson saw Britain being adequately served by her Empire now, he said that prolongation of the war would probably require her to turn to the United States for larger quantities of foods—products such as lard and canned goods.

"In the event this should happen," he said, "it is possible that the sale of agricultural commodities to Great Britain might depend on the extension of credit by the United States. This, of course, would call for a revision of our present policy, and would place squarely before farmers the question of whether they would be willing to risk a loss in order to hold the United Kingdom markets."

In recent years, Mr. Hutson pointed out as an illustration of Britain's importance as a market, that country has taken from this country 10 per cent of our lard, 3 percent of wheat, 20 percent of raisins, 25 percent of canned pears and 5 percent of apples.

CAPITAL VIEWS

FOOD PRICE CONTROLS—New Deal economists are making every possible effort to prevent an upward spiral in the cost of living. They realize that if prices jump sharply there must be corresponding wage increases, and the country may then be entered into an inflationary movement difficult to control. Food prices are particularly under consideration, because they concern every wage earner. But official Washington still is attempting the impossible in this regard. They seek to increase the price of agricultural commodities as paid to the farmer without allowing the products made from these crops or animals to rise at retail. The resulting squeeze on food processors may be serious by spring.

CENTRALIZED BUYING—Big food manufacturers will welcome the new program of buying food for the Army at central stations located in San Francisco, Chicago and New York. Small companies seeking to have a part in the new buying program can appeal through nearby Quartermaster Corps offices to insure that they have an opportunity to bid for supply of any goods needed in their territory. The centralized buying is not intended to preclude this local sales effort; but it will if companies do not hustle around and maintain their lines of communication into the big buying offices.

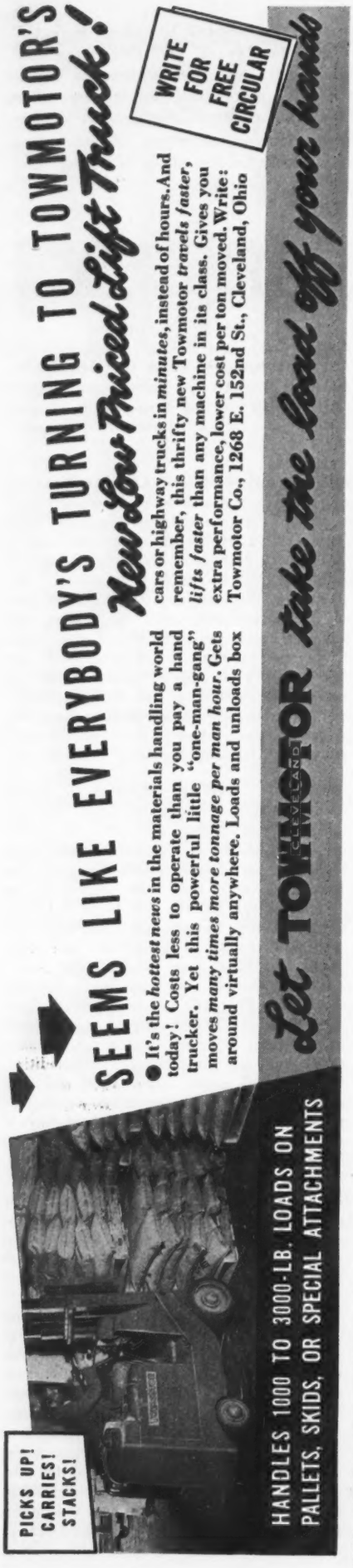
ANOTHER "WELFARE" LEADER—Acting through the "Council of National Defense," the President has designated Federal Security Administrator Paul McNutt as "coordinator of all health, medical, welfare, nutrition, recreation and other related fields of activity affecting the national defense." Washington thinks that this will curtail slightly Miss Harriet Elliot's ambitions and return her efforts to the price-control job for which she was named. More important is the evidence that reform effort in the interest of underprivileged families is going to be continued just as aggressively during the defense emergency as it has been during the past eight years. However, the coordination of this effort under a practical administrator of real organizing ability, such as McNutt, may give more practical results than the dole systems of the past.

MIGRANT WORKERS—Led by Mrs. Franklin Roosevelt, the Washington groups interested in housing and welfare are now campaigning for better care of migrant workers. In the spotlight first is the problem of giving defense employment to such people. But it will not be long before the migrant food-plant and agricultural workers will be investigated also. This is going to make it necessary for growers and factory managements to be prepared to defend (or correct) their employment, housing and wage practices.

WHAT OF FOOD TAXES?—Washington believes that a new form of processing taxes on certain food raw materials may get special attention under "income certificate plan" proposals. There will be real effort to cut non-defense spending. But processing taxes can be levied to pay part of the agricultural relief bill. That will make it easier for farm bloc Congressmen to defend, or even to increase, such disbursements while appearing to balance this non-defense portion of the budget. Hence a desire for a balanced budget furnishes merely a new incentive for imposition of these food industry taxes.

FOREIGN FOOD MARKETS—Uncle Sam is loaning money to Latin America under conditions that will assist the Latins in selling foods to Europe. Interlocking loans by the Export-Import Bank to the Argentine, and from the Argentine as credits to the British, are an outstanding example. This avoids the restriction on American credits to belligerents and debt defaulters. It also encourages more movement of processed food from South America to Britain. This may not be significant just now when the British buying is restricted by the limit of credits which can be allocated for any nonessential commodities. Even canned goods, dried fruit and like commodities find difficulty in moving, though the British would be delighted to buy if they had dollars. The danger is that new habits of food purchasing will be set up, breaking down markets formerly monopolized by American food processors. This reasoning is being used as an argument in the campaign for legislation which would permit this country to make direct loans to Britain.

NEW PRICE CURB—To control the price of copper, about 10 percent of next year's requirements will be imported from Chile. No one knows how much further this idea may go. Certainly if any important commodity price gets out of hand, the present disposition of Washington will be to bring in enough Latin American material (let's say beef, for example) so that the price will go back where the planners think it ought to be. Wise handling would be effective. Extreme measures would be —Well, you guess!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Defense May Speed Fortification of Food

Committee headed by Mayo man to consider nutrition problem

VITAMIN fortification of many common everyday foodstuffs appears likely to get considerable stimulus from the present national defense emergency. A special committee has been named by the National Research Council at the request of Miss Harriet Elliott, defense consumer commissioner, to concern itself with improving the nutrition of the general population.

The committee, headed by Dr. Russell M. Wilder, of Mayo Clinic, is practically speaking on expansion of the Council's sub-committee—of which Dr. Wilder also is chairman—which has for some time been advising with the Army and Navy on nutritional problems for the military. Specialists in agriculture, industry and science dealing with food and nutrition are serving with Dr. Wilder.

At its first meeting in Washington in December, the committee considered the question of vitaminization of white flour, a subject which also is getting attention from the industry at present. No conclusions were announced by the committee. Possibilities of improving the quality of sugar, which likewise is deprived of vitamins and minerals in the refining process, are scheduled for early consideration. Nutritional qualities of numerous other staple foods will be taken up one by one.

Britain Buys 260 Times As Much American Milk

UNITED STATES exports of processed milk to the British market during the first 10 months of 1940 amounted to 71,000,000 lb. as compared with 274,000 during the corresponding period of 1939. This was reported by the Office of Foreign Agricultural Relations on Dec. 16.

The United Kingdom has long depended mainly on overseas sources for its requirements of condensed milk, milk powder and preserved milk. A large part of such imports, however, came from Continental countries.

Indications are that the United Kingdom is now confronted with a shortage of milk because of limited feed supplies and lack of processed milk from the Continent.

INDICATORS

COTTONSEED OIL consumption in November, 1940, was 285,655 bbl. compared to 315,764 bbl. in October, 1940, and to 266,438 bbl. in November, 1939.

BEET SUGAR ACREAGE for 1941 has been set at 820,000 acres, 17 percent below the 990,000 acres allotted in 1940.

SUGAR DELIVERIES, first ten months of 1940, totaled 5,740,691 short tons raw value, compared to 5,928,677 tons for the corresponding period a year before.

CITRUS FRUIT, all kinds including juices, canned in Florida in the 1939–1940 season is finally reported by the Department of Commerce at 13,156,569 cases, compared to 11,377,638 cases in the preceding season and 8,260,441 cases two years ago.

PORK, cut, in storage in Chicago on November 30, 1940, was 56,027,160 lb., compared to 47,232,163 lb. a year before.

FLOUR PRODUCTION in November, 1940, as reported by *The Northwestern Miller* for mills representing 64 percent of U. S. output, was 5,831,462 bbl., compared to 5,356,716 bbl. a year before.

OLEOMARGARINE sales in October, 1940, as represented by sales of internal revenue stamps, totaled 29,707,754 lb., an increase of 28.9 percent over the 23,043,972 lb. sold in October, 1939.

OLEOMARGARINE sales for the first ten months of 1940 totaled 258,146,676 lb., a gain of 5 percent over sales in the corresponding months of the preceding year.

MILK PRODUCTION per day per capita is estimated at 2.07 lb. for October, 1940, compared to 1.98 lb. in October, 1939, and to a 1934–1938 average of 1.99 lb.

MILK PRODUCTION per cow on November 1, 1940, was the highest recorded for the date in 16 years, and exceeded the November 1, 1939, figure by 3½ percent.

BUTTER, creamery, produced in October, 1940, was 135,435,000 lb., 11 percent above production in the corresponding month of the previous year.

BUTTER, creamery, produced in the first ten months of 1940 totaled 1,567,790,000 lb., an increase of 2.2 percent over production in the corresponding months of 1939, and of 7.9 percent over the average production in 1930–1938 for these months.

Editor's Note

The curves which formerly appeared on these pages, showing the movement of various indexes and indicating probable trends in the food industries, are omitted for the time being. The present plan is to present these curves only occasionally, at such times as marked changes occur. If this plan inconveniences any readers, please inform us and we will go back to regular presentation of the curves.

CHEESE, American, produced in October, 1940, totaled 46,050,000 lb., an increase of 14 percent over October, 1939, and of 31 percent over the 1930–1938 average for the month.

CHEESE, all kinds, produced in the first ten months of 1940 was 658,200,000 lb., compared to 601,560,000 lb. produced in the same period of 1939.

BEER SALES in October, 1940, totaled 4,193,831 bbl., compared to 4,169,399 bbl. in October, 1939.

BEER SALES, first ten months of 1940, totaled 44,095,095 bbl., a decrease of 2 percent below sales for the corresponding months of the preceding year.

FRUITS, frozen, in storage on December 1, 1940, amounted to 153,920,000 lb., compared to 141,580,000 lb. on December 1, 1939, and to a 1935–1939 average of 114,201,000 for the date.

VEGETABLES, frozen, in storage on December 1 of this year totaled 84,047,000 lb., compared to 76,042,000 lb. in storage on the same date of the preceding year.

BUTTER, creamery, in storage on December 1, 1940, was 67,703,000 lb., compared to 89,783,000 lb. a year before and to a 1935–1939 average of 95,484,000 lb. for the date.

CHEESE, all kinds, in storage on December 1, 1940, totaled 136,565,000 lb., compared to 112,217,000 lb. on December 1, 1939, and to a 1935–1939 average for December 1 of 113,504,000 pounds.

EGGS, case equivalent, in storage on December first of last year amounted to 4,570,000 cases. The number a year before was 4,089,000 cases and the average for the date was 4,507,000 cases in 1935–1939.

POULTRY, all kinds, frozen and in storage on December 1, 1940, amounted to 159,056,000 lb., compared to 127,649,000 lb. one year before and to a 1935–1939 average of 117,995,000 lb. for the date.

MEAT, all kinds, in cure and frozen storage on December 1, 1940, amounted to 547,078,000 lb., compared to 473,101,000 lb. a year before and to 485,010,000 lb. as an average for the date in 1935–1939.

LARD IN STORAGE on December 1, 1940, was 231,823,000 lb., compared to 88,955,000 lb. on December 1, 1939, and to a 1935–1939 average of 68,818,000 lb., for the date.

COST OF LIVING index of National Industrial Conference Board for November, 1940, was 85.5, the same as in the preceding month and 0.5 percent above the index for the corresponding month of the preceding year.

Weekly wholesale food price index of Dun & Bradstreet stood at $2.49 on December 10, 1940, the highest figure since March 8, 1938.

Prevent Spoilage, Protect Quality

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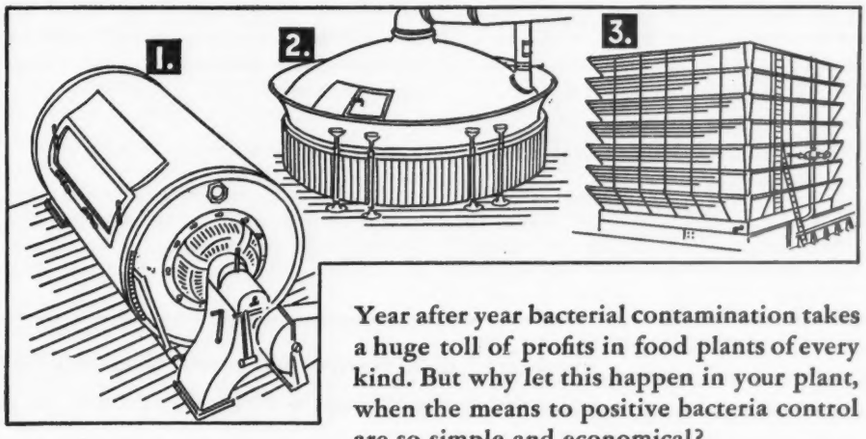

1. To prevent off-flavors and lowered quality in butter, it is essential to keep churns free from bacterial contamination. In addition to the regular thorough rinsing and cleansing, they should be treated before each use with a 200 p.p.m. solution made from HTH Products.

2. In breweries, HTH Products protect product quality by dependable sterilization of all utensils, pipe lines, filtermass, fermenters, bottles and bottle-fillers, etc.

3. Algae in condenser water causes slime in cooling towers, cuts down the efficiency of the refrigerating system. Ice plants use HTH Products to kill algae in cooling water, also to insure pure water for making ice.

Year after year bacterial contamination takes a huge toll of profits in food plants of every kind. But why let this happen in your plant, when the means to positive bacteria control are so simple and economical?

HTH Products*are chlorine sterilizers in convenient powder form, always full-strength and dependable in action. Added to water, they quickly make fast-killing hypochlorite solutions of the desired strengths for flushing, wiping or spraying all surfaces with which food products come in contact. And being in concentrated form, HTH Products are so economical to use that their positive germ-killing action can be applied throughout the entire plant.

Let HTH Products go to work in your plant now—help you prevent spoilage losses and protect the quality of your finished products. Send for literature and full information.

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More Wheat Expected

Unusually favorable moisture conditions in the winter wheat belt promise a 1941 crop exceeding the more than ample output of 1940. Average of estimates made on December 1 indicate an output of 595,000,000 bu., compared to the 1940 crop of 556,000,000 bu.

Argentine now expects a 1940–1941 crop of 293,000,000 bu., compared to the preceding crop of 119,000,000 bu. Allowing only normal crops for other wheat exporting countries, it is evident that the already heavy wheat carry-over is likely to be increased this year.

Fish Holdings at Record

According to the U. S. Department of the Interior, cold storage holdings of fishery products were at an all-time high on November 15, when 97,627,000 lb. of domestic and imported products were in stock. The previous record was 94,695,000 lb. in December, 1936. This record figure represents a 4 per cent increase over the preceding month and a 15 percent increase above the figure of the preceding year.

Pork Still at Record High

Record marketings of hogs throughout the past three months cannot be maintained, as the supply of animals must decrease because of the smaller 1940 spring and fall pig crops. These smaller pig crops were, in turn, partly a result of an unfavorable hog-corn ratio, just as are the present large offerings for slaughter. As a result of this situation, which must soon result in a considerable decrease in hog population, the hog-corn ratio may be expected to turn and become more favorable again to increased hog numbers. In fact, some look for this by the fall of 1941.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded December (thousands)	Total Awarded 1940 (thousands)
Bakery	$2,140	.....	$2,576
Beverages	2,600	$230	7,844
Canning and Preserving	60	.....	1,043
Cold Storage Plants	40	.....	585
Confectionery	140	.....	570
Grain Mill Products	480	80	3,974
Ice Manufactured	.....	.....	271
Meats and Meat Products	115	150	2,606
Milk Products	175	40	2,051
Miscellaneous	285	560	7,066
	$6,035	$1,060	$28,586

Commodities Still Steady

Little change occurred in basic commodity prices during the month from November 16 to December 14, according to the *N. Y. Journal of Commerce* weekly index of commodity prices. This index stood at 81.9 on the earlier date and at 81.7 at the end of the period. During the same period, the index of grain prices of the same publication fell from 69.7 to 66.4, while the food price index rose from 67.8 to 68.8.

In contrast, the U. S. Department of Labor's wholesale commodity index rose from 78.8 on November 9 to 79.8 on December 7. Also, between the same dates, the Labor Department index for farm products rose from 67.2 to 69.8 and for foods from 71.7 to 73.9. The business activity index of *Business Week*, which stood at 139.6 on November 9 rose to 141.0 on December 7.

Individual commodity prices showed the usual spotty picture for the period from mid-November to mid-December. Wheat, No. 2 dark winter, at 84¾c. on November 15, fell to 82¾c. by December 13. In the same weeks corn, No. 3 yellow, fell from 65c. to 59¼; and flour fell from $5.25 to $4.95. Beef increased slightly from 17c. to 17½c.; lamb fell from 15½c. to 15c.; and pork fell from 14½c. to 13c. Among the dairy products, eggs increased from 23c. to 26c.; butter from 33¼c. to 35¾c.; and cheese from 17¾c. to 19c. Imported foods showed increases, with coffee moving from 7c. to 7¼c.; sugar from $2.90 to $2.95; and cocoa from $4.85 to $5.26. Among the canned foods, salmon increased from $2.40 to $2.50 and peaches from $1.20 to $1.30.

Summary* of indicated per capita food supplies available for domestic consumption in 1940–1941[1], and in previous years.

Commodity	Average 1925–29 Pounds	1937–38 Pounds	1938–39 Pounds	1939–40 Pounds	Indicated 1940–41[2] Pounds	Maximum available 1940–41[3] Pounds
Meats other than poultry	137.7	124.3	125.7	136.7	136.7	138.5
Poultry meats	21.3	20.2	20.4	21.6	20.3	20.4
Eggs	40.8	39.1	38.6	38.7	37.7	38.0
Butter	17.4	16.6	17.6	17.5	17.1	17.2
Dairy products other than butter, in terms of whole milk	433.8	454.6	459.1	468.6	469.8	472.8
Lard	12.7	11.2	12.3	13.7	14.9	17.7
Other domestic edible fats and oils	15.8	20.5	17.3	18.1	18.9	19.5
Imported edible fats and oils	2.8	3.8	4.2	3.2	2.8	2.8
Wheat[4]	254.1	231.0	241.0	236.0	230.7	324.3
Rice[4]	6.9	8.6	7.4	8.3	8.5	11.9
Fruits, fresh	115.4	140.3	137.4	139.5	148.9	153.4
Fruits, canned	13.0	19.7	20.5	22.6	22.7	23.8
Fruits, dried	5.3	5.7	5.8	6.8	6.1	8.5
Vegetables, fresh	85.0	95.6	98.5	99.3	101.4	101.4
Vegetables, canned	18.8	25.8	23.1	24.5	24.5	25.6
Potatoes	148.2	155.0	143.8	140.4	143.1	143.1
Sweet potatoes	23.4	26.3	26.6	25.2	23.7	23.7
Dry edible beans[4]	8.6	9.5	10.2	9.9	9.8	10.6

[1]In calculating the per capita consumption of the various classes of foods, no account was taken of the quantities which usually are lost or wasted in the marketing processes, and therefore, these data should not be assumed to represent actual per capita consumption. The population figures are the July 1 estimates of the Bureau of the Census through 1938 with unofficial estimates of the Bureau of Agricultural Economics for the later years.

[2]Per capita total supplies less estimated exports and probable carry-over into 1941–42. In the case of wheat, rice, potatoes, sweet potatoes, and dry edible beans, the quantities expected to be used for seed and feed are also deducted.

[3]Per capita total supplies less a minimum carry-over into 1941–42, with no allowance for exports. In the case of wheat, rice, potatoes, sweet potatoes, and dry edible beans, the quantity expected to be used for seed and feed are also deducted.

[4]Includes varying quantities shipped to noncontiguous territories.

*By U. S. Department of Commerce: Industrial Reference Service, Part 3, Foodstuffs, No. 5, December, 1940.

War Affects Spice Trade

(*Continued from page 45*)

trying now to get this product from Turkey.

As for saffron, produced largely in Spain but also to some extent in France and Greece, Mr. H. Schoenfeld of H. Schoenfeld & Sons, Inc., of New York, still gets what he needs from Spain. But even in November, 1939, the wholesale price of saffron topped all others at $45 a pound.

Sage, once cultivated in American gardens, is so popular that demand outgrew production. The strongest and finest flavored grows in Yugoslavia, but cannot now be had from that source. Savory and thyme from France are no longer available. But, in any case, there are enough spices in the United States to last for awhile at least. And, just as New York has become the World's pepper mart, carrying large stocks for redistribution, a movement is now under way to build up reserves in this country of the standard spices, cinnamon, cloves, allspice, mace and nutmeg.

Processing Salt Stock

(*Continued from page 58*)

Next morning the drain plug was removed from the tank, and all the process water was drained to the sewer, after which the pickles were immediately rinsed well with fresh water; the tank plug was then replaced and the tank filled with fresh water and well agitated. The pickles were now ready to pack into barrels for sweet pickles, sour pickles or processed dill pickles.

In former days all sizes of vat run salt stock were processed together, with the result that the packer (manufacturer) often found he had a quantity of certain sizes of processed pickles in vinegar for which he had no market. For the trade would take only those sizes that show the best profit and often the less desirable sizes would have to be carried so long they were no longer merchantable (due to softening). The only salvage for them was to convert them into relish or "dump" them on some cheap market.

The fact that all sizes of pickles were not saleable at the same time caused much worry and study. This led to the plan of assorting the brine stock into different sizes before processing, for brine stock will "keep" far longer than finished pickles. Then only the desired sizes need be processed. In time the trade accepted 20 different sizes of straight pickles, several sizes of nubs and crooks, and broken or hollow pickles (the latter for relish and tartar sauce stock). Reproduction of the sizes and shapes requires more space than is available here.

Faults of Older Practice

The many objections to the older method led to improvements in procedure and equipment. For one thing it did not produce uniform results, for the only constant factors were (1) a tank two-thirds full of water; (2) 10 bbl., or 60 bu. of brine stock; (3) 2 lb. of turmeric; (4) 30 lb. of alum. No thought was given to the salt content of the brine stock, the brine of which would test 45, 50, 60 deg. Sal. and sometimes higher. Since processing is essentially a method of dilution, variations in the salt content of brine stock would lead to subsequent variations in the brine content of the process water of as much as 10 deg. Sal. Since the pickles were presumed to be in equilibrium with the process water at the end of the 24 hour process, the pickles would probably vary in the same manner. A 10-deg. Sal variation is equivalent to about 2½ percent of salt.

Furthermore, heating to 120 deg. F. was very objectionable because of its effect on the physical structure of the pickles. Subsequent experience shows that 85 deg. F. is about the top permissible temperature for processing if firm crisp pickles of good quality are to be produced.

Attempts to improve the methods of processing included the use of square tanks and oblong tanks in an effort to economize on floor space. But pickles lodged in the corners and could not be stirred properly, thus leading to further irregularities in the salt content. To circumvent this problem, compressed air was tried as a means of stirring in square corners. Compressed air has had a measure of success in this use and is now employed in many plants to agitate round tanks for it requires less manual labor. But the square and rectangular tanks have never been entirely satisfactory, notwithstanding. My own preference is for hand agitation with the paddle. The use of compressed air in this service is fairly expensive.

Another objection to the older method of processing was the fact that the tanks must be stationary. Also that each tank required separate equipment and that the space occupied by tanks could never be used for any other purpose.

In the next installment the author will describe the oval portable process tank that has proved a great improvement and cost saver; also the means of instituting close quality control.—THE EDITORS.

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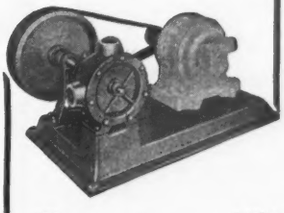
to pump "light liquids"?

to pump "heavy liquids"?

to pump against pressures?

to deliver a steady discharge?

to deliver large or small capacity?



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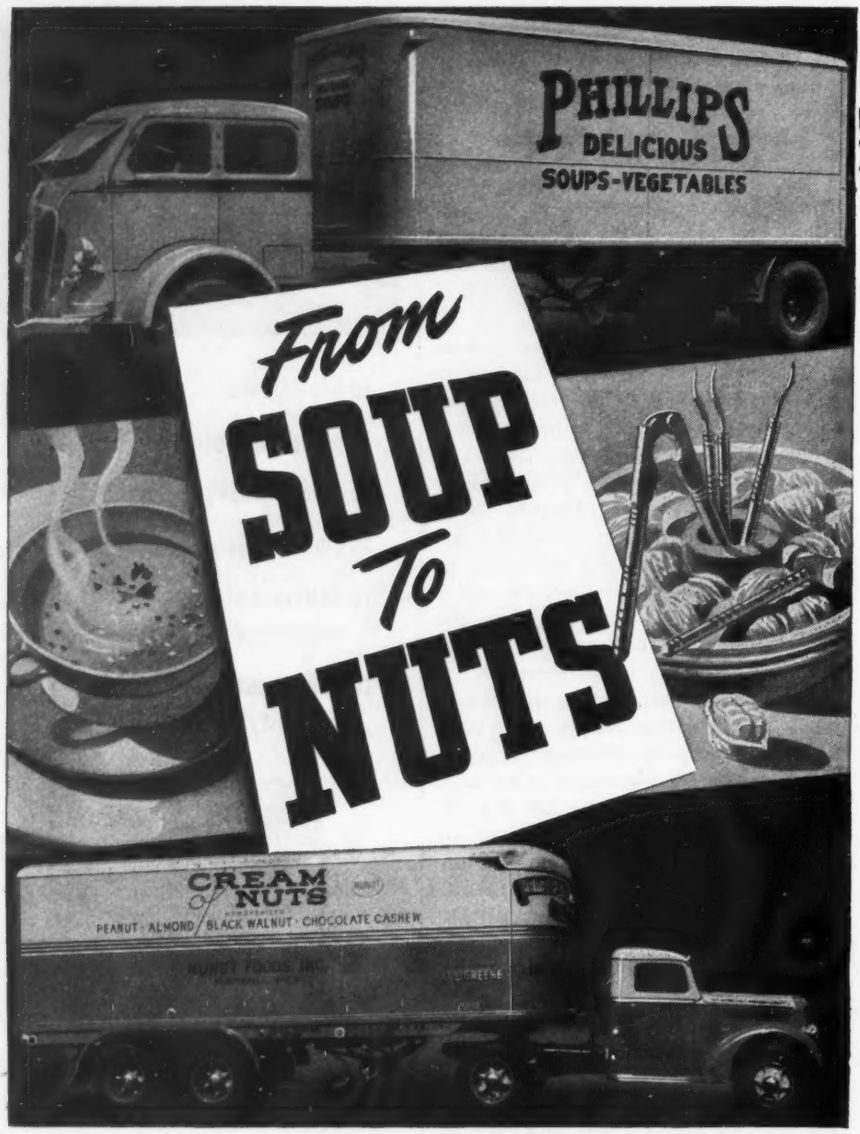

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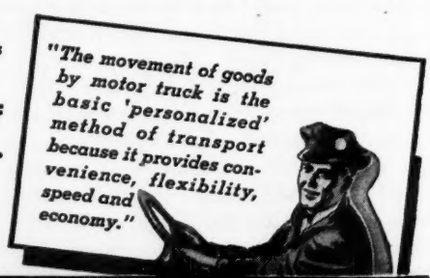
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INDUSTRY

Alaska Pacific Salmon Co., Seattle, has sold four large properties, including canneries and fish traps, to P. E. Harris & Co., Seattle. Cash involved was reported to be between $1,500,000 and $2,000,000.

Blue Plate Foods, Inc., Wholly owned subsidiary of Wesson Oil & Snowdrift Co. of New Orleans, has taken over a two-story loft and warehouse building in Richmond, Va., for the manufacture of mayonnaise, dressings, sauces, sandwich spreads and allied products.

Canada Dry Co. of Florida is building an $80,000 plant at Tampa.

Dwight Edwards Co., Ltd., has opened a new $175,000 coffee roasting plant at Vancouver, B. C. The building was equipped at a further cost of $100,000. The company's products will be featured throughout western Canada by Safeway Stores, Ltd.

Grain Cereal Products Co. has been organized in Minneapolis by M. H. Sargent, A. M. Baker and C. M. Smith to market a new type of wheat germ in different varieties, flaked, granules and flour.

Hauseman Packing Co. will construct a packing and byproducts plant at Brownsville, Tex., to cost about $50,000.

Walter H. Johnson Candy Co. will build a new factory in Chicago, 200x350 ft., and occupying 70,000 sq.ft.

Kraft Cheese Co., Chicago, will construct an oleomargarine factory in Denison, Tex., which will serve the Southwestern states. A branch sales warehouse will be built in Dallas. The establishment of a major cheese and margarine plant in Memphis is under consideration. A Kraft plant in Greenwood, S. C., has been discontinued because of a falling off in the local milk supply.

H. W. Madison Co., Medina, Ohio, a pickle canner, is building a 500,000-sq.ft. addition for storage purposes, doubling the plant's floor capacity.

Manhattan Pickle Co., Chicago, is building a $125,000 one-story and basement plant.

Martin Peanut Products, Inc., Chicago peanut butter manufacturer, has merged with Product Corp. of America, Chicago manufacturer of mayonnaise, jams, jellies and preserves, to form Martin Food Products, Inc.

Pabst Brewing Co. will spend $1,000,000 within the next two years to improve its Milwaukee and Peoria plants. About $100,000 is being spent to add another story to the Peoria bottling house and to install more equipment.

Pepsi-Cola Co.'s proposed merger with Loft, Inc., has been abandoned because of tax difficulties. The Bureau of Internal Revenue took the position that such a merger as submitted to stockholders was not a tax-free reorganization.

Pureta Sausage Co. will construct a $45,000 addition to its Sacramento, Calif., plant.

P. J. Ritter Co., Bridgeton, N. J., has purchased the 50-year old preserve and jelly business formerly owned by Mrs. G. L. Harting, Inc., of Philadelphia.

Skaneateles (N. Y.) Farm Products Corp. will build a $50,000 milk processing plant.

Velvet Freeze Ice Cream Co., Inc., St. Louis, will increase its storage facilities by building a two-story, brick and renforced-concrete addition, 45x110 ft., to its plant.

Wabasha (Minn.) Roller Mills, Inc., has been licensed by Morris Mills, Inc., Chicago, to manufacture a natural wheat-germ flour. The new vitamin white flour will be sold under the brand name, "Enerjo."

L. A. VAN BOMEL

He is slated to become president of National Dairy Products Corp., New York, in April, when Thomas H. McInnerney, president and founder, becomes chairman of the board. Final action will be taken at a board meeting in April. Mr. Van Bomel is executive vice-president of National Dairy and president of Sheffield Farms, Inc., a subsidiary.

C. C. COLBERT

Nehi Corp., Columbus, Ga., has elected him president and general manager to succeed H. R. Mott, who has become chairman of the board of directors. Mr. Colbert is succeeded in turn by Willis Battle, a Columbus attorney, who was named vice-president and secretary.

PERSONNEL

George O. Anderson, of Duluth, has been elected president of Northwest Association of Ice Cream Manufacturers. Elmer Redman, of Red Wing, was named vice-president.

George K. Budd has resigned as chief engineer of American Maize-Products Co. at Roby, Ind., to accept a comparable position with Campbell Soup Co., Camden, N. J.

D. H. Burton and associates are contemplating the establishment of a rice mill, to have a 400-bbl. capacity, in Newport, Ark. Modern rice milling machinery has already been bought.

N. H. Darsky and associates, owners of Golden Age Ginger Ale Co., have acquired control of J. F. Giering Bottling Co., Youngstown, Ohio, which holds the Pepsi-Cola franchise in Mahoning, Trumbull and Columbiana counties. A $75,000 expansion program, including a new building, is in progress. Mr. Darsky will act as manager of the Giering firm.

O. E. JONES

ALBERT F. HUNT

Swift & Co., Chicago, will present them as nominees for directors at the annual meeting of shareholders to be held Jan. 16. They were both elected vice-presidents in 1936. Mr. Hunt is in charge of plant operations, the construction department and the research laboratories. Mr. Jones has jurisdiction over the branch house and plant sales, hotel, contract and institution, canned goods, and soap departments.

Theodore Fetherston, research chemist with Griffith Laboratories, Chicago, will head the laboratory in the company's new plant at Newark, N. J. Joseph Radov, formerly on the technical staff of National Cereal Products Co., has joined Griffith's research staff in Chicago.

John E. Glen has become manager of the Sioux City, Iowa, plant of Swift & Co.

George Hampton will act as personnel head in his new position as industrial relations supervisor of General Foods' plants. He was assistant plant manager of the Post Products Division of General Foods, at Battle Creek, Mich.

R. M. Jewell, of Jewell Ice Cream & Milk Co., Mt. Vernon, Ohio, has been elected president of American Butter Institute. R. E. Pearsall, of Armour & Co., Chicago, was named vice-president.

Leonard E. Kopitzke, of Marion, heads up Wisconsin Cheese Makers' Association.

Grover J. Meyer has been elected president of Renner Brewing Co., Youngstown, Ohio, to succeed Emil J. Renner who has become chairman of the board. Mr. Meyer was vice-president and general manager of sales of Truscon Steel Co., Youngstown.

Karl F. Mogg, meat dealer, has purchased a controlling interest in Steiner Packing Co., Youngstown, Ohio. He has become president but his sons, Karl F. Mogg, Jr., and Richard, will assume active management. The manufacture of sausage and luncheon meat specialties will be added to the business.

Frank W. Regan and associates, of Wheeling, W. Va., have purchased Stedman Co., Athens, Ohio, from John Winder, founder and president, who will retire. The new owners plan to market Stedman meat products nationally.

Charles W. Taussig, president of American Molasses Co., who is a member of President Roosevelt's Advisory Council for the Virgin Islands, will head a commission investigating economic conditions in the British West Indies.

Dr. James A. Tobey, director of the department of nutrition of American Institute of Baking, New York, has been appointed by the Institute of Food Technologists as chairman of the committee on food and nutrition in national defense.

R. E. Walker has been appointed to a new post as production manager of British Columbia Packers, Ltd., Vancouver, B. C. Mr. Walker was a partner in Edmunds & Walker, Ltd., which was purchased by B. C. Packers last year.

R. Dale Weber has been made vice president in charge of the southern California plants of Interstate Bakeries Corp. James W. Costello has resigned as vice-president.

E. L. Widemire, of Sylacauga (Ala.) Ice Cream Co., has been elected president of Southern Association of Ice Cream Manufacturers. E. J. Mather, of Southern Dairies, Washington, D. C., was named vice-president.

George A. Wright has succeeded the late James A. Law as president of Wilsil, Ltd., Montreal.

DEATHS

Henry Brunie, 83, a director and former vice-president of Francis H. Leggett & Co. of New York, Dec. 5, at Pasadena, Calif.

George D. Clews, 53, treasurer and director of Great Atlantic & Pacific Tea Co., Dec. 5, at South Orange, N. J. He was a grandson of George Huntington Hartford who founded the company.

J. P. Foohey, 43, who was only recently elected president and general manager of Peter Eckrich & Sons, Inc., Kalamazoo, Mich., Dec. 6, at Coral Gables, Fla.

Alexander G. Hoefler, 71, a founder and director of General Ice Cream Corp., Buffalo, N. Y., recently.

Andrew P. Jaeger, 76, purchasing agent for Henry Heide Candy Co., New York, Dec. 15. He had been with the company for 60 years.

Oliver P. Schneeweiss, 82, former cashier of Walter Baker Chocolate Co., who later headed the frozen food department of General Foods Corp., Nov. 24, at Elizabeth, N. J.

Maxwell Tausek, 59, president of the New York sirup and molasses firm which bears his name, Nov. 30.

George C. Warneke, 50, executive of Peerless Confection Co., Chicago, recently. He was a vice-president and director of Chicago Candy Manufacturers Association.

ASSOCIATED INDUSTRIES

American Can Co., New York, has elected Maurice J. Sullivan, president. He was formerly vice-president in charge of the Pacific district until recently named executive vice-president shortly before the death of President Herbert A. Baker. T. N. Anderson has been named executive vice-president and comptroller and D. W. Figgis, executive vice-president of the company. C. H. Black was made vice-president in charge of sales.

American Society of Refrigerating Engineers has elected L. Logan Lewis president. He is vice-president in charge of engineering of Carrier Corp.

Baker Ice Machine Co., Omaha, Neb., has appointed A. J. Mallinckrodt manager of its refrigeration division. The firm of Edward H. Reuss, Jr., Inc., has been named Philadelphia distributor.

C. O. Bartlett & Snow Co., Cleveland, has appointed M. P. Hoffmann manager of research and sales of its new colloid mill department.

Fritzsche Brothers, Inc., New York, has installed a fully equipped flavor-testing laboratory and experimental kitchen which will permit the study of flavors under actual conditions of manufacture.

Frozen Food Research Bureau has been organized at Portland, Ore., to act as a clearing house for developments in the frozen food industry. Victor Dallaire is director, W. L. Morrison is technical adviser, and Miss Kay Carter is in charge of a recipe service.

Foods That Aided Blitzkrieg

(*Continued from page 43*)

milk albumins spiced with herbs which may be added to other dishes. By varying the condiments, new flavors can be developed. The Germans claim that "the albumin, fat and carbohydrate content of Bratling powder is so nourishing that it has proved far cheaper than other vegetable and animal foods."

The German military diet is not entirely without meat, but what there is of it is made to go a long way. Meat has been made to go further by the addition of germinating grain, especially to sausage. For germinating grain and its juices, a high vitamin content is claimed. Sausages are "stretched" during grinding by the addition of artificially germinated soybeans and rye grains.

The Germans claim also that they have developed pure vitamin C which they use in candies as an anti-scorbutic. To assure a regulated apportionment, small fractions of the acid are twice worked into candies with dextrose, fat and whey.

The demand for fresh vegetables in the field the Germans have tried to meet with issues of vegetable juices. There is spinach juice and cabbage juice (and others) which are made into a dough or paste and served to the troops as spinach or cabbage noodles. Tomato is issued as puree, pulp or powder and is adapted to a variety of uses.

Dehydrated cabbage, carrots and spinach also are compressed into brick form and issued as dried vegetables. Sauerkraut, dried and compressed into cubes, is found in every army kitchen; and the traditional love for it has not been diminished under the administration of the Third Reich.

American quick freezing methods are extensively used for meats, fruits and vegetables, and the German military authorities are lavish in their praise of the system, especially as a means of preserving vitamins.

Faced with the likelihood of shortages of meat, the German Army has made special effort to protect it in transport. Meat is packed already roasted or cooked. Pork hocks and chops are packed in corrugated cardboard boxes. The cartons then are compressed to double shoe-box size and the contents are frozen gradually. Under favorable conditions, it is claimed that these products will stand journeys of five to six days without refrigeration, and can be kept frozen for years. In addition, it is said that the changes in packing have effected a saving of 400 percent in space. But nothing has been given out about the packaging and interior protection of such frozen foods.

For the soldiers who may become detached for an extended period, the Germans have a highly concentrated food they call "Pemmikan." The idea was borrowed from the American Indians, who prepared it from dried game and cranberries for use in extended migrations. The Germans issue their Pemmikan to tank, fortress and mountain troops as well as to their air crews.

The "Pemmikan-Landjaegar," as it is technically called, contains smoked meat, bacon, soybean flour, dried fruits, whey, tomato pulp, yeast, green pepper, cranberries and lecithin—all substances necessary for building up the body, including carbohydrates, protein, fat and mineral salts.

The Germans also have developed a product containing dextrose, whey, milk, fat and vitamin C, which was issued to the troops in Norway under the designation of "V-drops."

The German ration is not one that an American soldier would relish and perhaps does not satisfy the palate, but it apparently has what it takes to keep men well and strong.

Letters to the Editor

Some of the 32 Inventions Have Already Been Made

To the Editor of FOOD INDUSTRIES

In the November issue, you list on page 35 some inventions needed by the food industries. May I call your attention to the following (the numbers refer to the items):

3. There are a number of perfected processes and methods whereby this may be done. Many mills are now doing it.

8. This suggestion is not practical. Soft wheat contains less gluten, less protein than hard wheat; no amount of activation will increase the development of this in any desirable way. This is a farm problem related to the types of wheat that are to be raised, not a problem for science.

9. There is only one possible way to do this and that is to hold these products at a given temperature and in a given humidity.

10. There are several successful processes for preserving bread by freezing. They are used commercially in Europe but so far only experimentally in this country.

11. Small loaves of bread lose their flavor in baking. If the family is not big enough to use a pound loaf in 48 hours, they should buy rolls.

14. There are yeasts with slow raising action at any temperature.

19. Ask the American Can Co. and they will tell you that canned orange juice is on the market with the flavor, color and vitamin content of fresh orange juice.

21. This alcohol can be recovered and is recovered commercially by some concerns. But alcohol can be produced so cheaply by other methods, and the amount recovered from a baker's oven is so small, that there is no incentive in applying this to all bakers.

29. Equipment has been developed and more equipment is in the process of development for quickly determining vitamin values in foods. In the past we depended upon nutritional laboratories, and these are still important in checking the results obtained by quick methods, but these are no longer necessary except for checking purposes.—L. J. SCHUMAKER, *president, American Cone & Pretzel Co., Philadelphia.*

Few Inventions Necessary

To the Editor of FOOD INDUSTRIES

On page 35 of the November issue of FOOD INDUSTRIES there are listed "32 Inventions Needed by the Food Industries."

A glance at these items indicates that we have quite some knowledge on numbers, 4, 6, 19, 21, 22, 23, 25, 26 and 31; that few, if any, inventions are necessary; and that the data already gathered are available.—HERMAN SEYDEL, *president, Seydel Chemical Co., Jersey City, N. J.*

33 Inventions Needed

To the Editor of FOOD INDUSTRIES

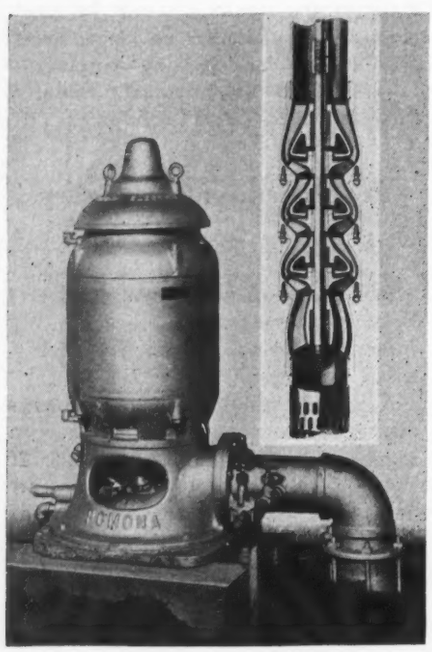
In looking through the November issue of your magazine, I notice 32 inventions needed in the food industries.

I respectfully call your attention to the fact that the most important one, as far as the wholesale and retail distributor of foods is concerned, has been omitted. That is a low-cost one-trip container for carbonated beverages, beer, liquid washing solutions, etc., which will eliminate the double handling by everyone concerned, of the growing return bottle proposition.—G. W. FLICKINGER, *S. M. Flickinger Co., Inc., Buffalo, N. Y.*

Food Equipment News

Vertical Turbine Pump

POMONA PUMP CO., Pomona, Calif., has brought out a new line of 6-in. medium capacity vertical turbine pumps. This line is said to embody improved impellers and seats, resulting in higher efficiency and better performance at lower operating costs. For example, for a capacity of 100 g.p.m., against 110-ft. lift in the well and 50 lb. pressure above the well, a 7½ hp. motor is required with this pump as against a 10 hp. motor with the previous design. The efficiency of this particular size of pump for this head capacity has been increased



Vertical turbine pump of improved design.

6½ points, the number of stages has been reduced by one-quarter and the initial cost of the unit has been lowered by about 20 percent.

Wheelbarrow Tire

B. F. GOODRICH CO., AKRON, OHIO, has developed a new rubber tire for wheelbarrows which is said to combine the advantages of both the pneumatic and solid types. Called the "Goodrich Silvertown Cushion Type Tire" this new tire is filled with resilient cushioning rubber. As a result, it is said to have the appearance and cushioning qualities of a pneumatic tire combined with freedom from punctures or leaks of a solid tire.

Granulating Machine

F. J. STOKES MACHINE CO., 5,900 Tabor Road, Philadelphia, Pa., has designed an automatic screen granulating machine of large capacity for use where headroom is limited. This machine is adapted to breaking down lumps formed while materials are being processed or are standing in containers; for reducing materials from dryers or filters to free-flowing granular powders and for granulating malted milk, coffee, extracts and similar products.

The machine is of all-steel construction and is housed to prevent the escape of dust. Outboard rotor bearings are provided to assure ample lubrication without possibility of contaminating the materials being processed. The manufacturer claims that granulation of improved screen analysis can be produced in large quantities and at low cost, with this type of granulator.

Barrel and Drum Lifter

A PORTABLE ELECTRIC ELEVATOR designed to lift barrels and drums and place them in storage racks is being made by Service Caster & Truck Co., 525 N. Brownswood Ave., Albion, Mich. The capacity of this machine in the standard size is 500 lb. and the maximum lift is 56 in. A feature is the beveled lifting arms, slightly closer together than the diameter of the drum, which slide under the drum as it rests on the floor and raise it to storage position. These arms, from outside to outside, measure slightly less than the width of each storage space, permitting the lifter to be pushed into the space and lowered, leaving the drum resting upon the rack.

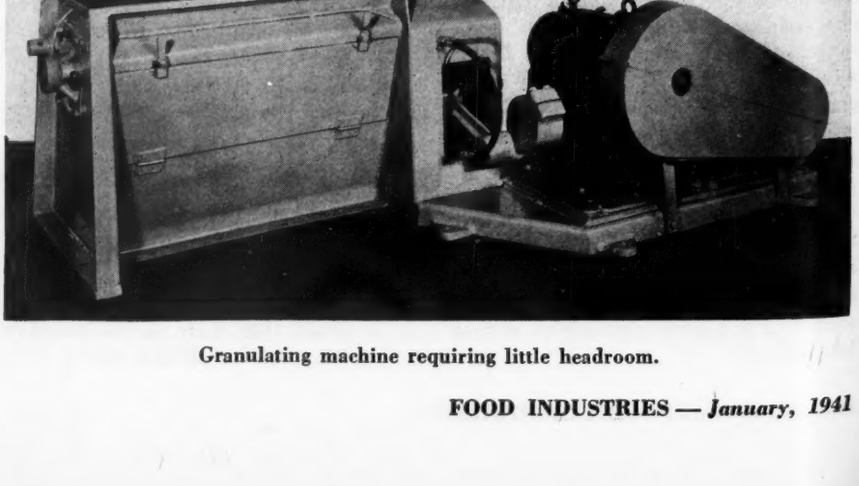
A hinged platform, 30x36 in., can be folded down, using the arms as supports, thus permitting the lifter to be used for regulation loads when it is not in use for lifting drums. Power is supplied from a hand-powered hoisting unit.

In addition to the standard model this lifter can be supplied for almost any required capacity or height of lift.

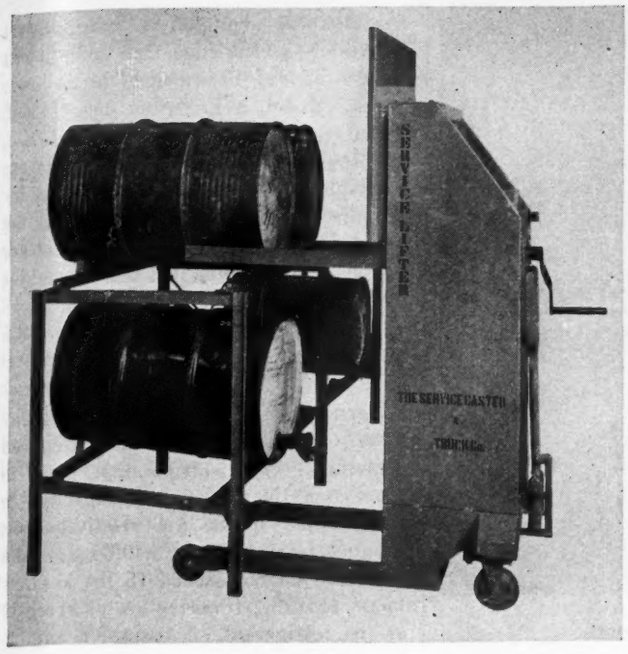
The barrel racks shown in the illustration were also made by Service Caster & Truck Co. They are made of electrically welded structural steel and are assembled in sections to carry four drums each. The drum supports at the back are higher so that the drums may be drained while in position.

Gasoline-Powered Lift Trucks

TOWMOTOR CO., Cleveland, Ohio, is manufacturing Model LT-40, a gasoline powered lift truck for loads from 1,000 to 3,000 lb. The truck has a 40-in. wheelbase with a turning radius of 68 in. Its overall width is 35 in. and its length without fork is 70 in. Interchangeable attachments such as forks, rams, scoops, flat plates or other special lifting devices can be supplied for the work to be done. Power is supplied from a 22 hp.,



Granulating machine requiring little headroom.



Lifter and stacker for drums or barrels.

Gasoline-powered lift truck for loads up to 3,000 lb.

4-cylinder gasoline engine. Speeds from 1 to 10 m.p.h. with two forward speeds and two reverse are available. The lifting and tilting system is hydraulically operated.

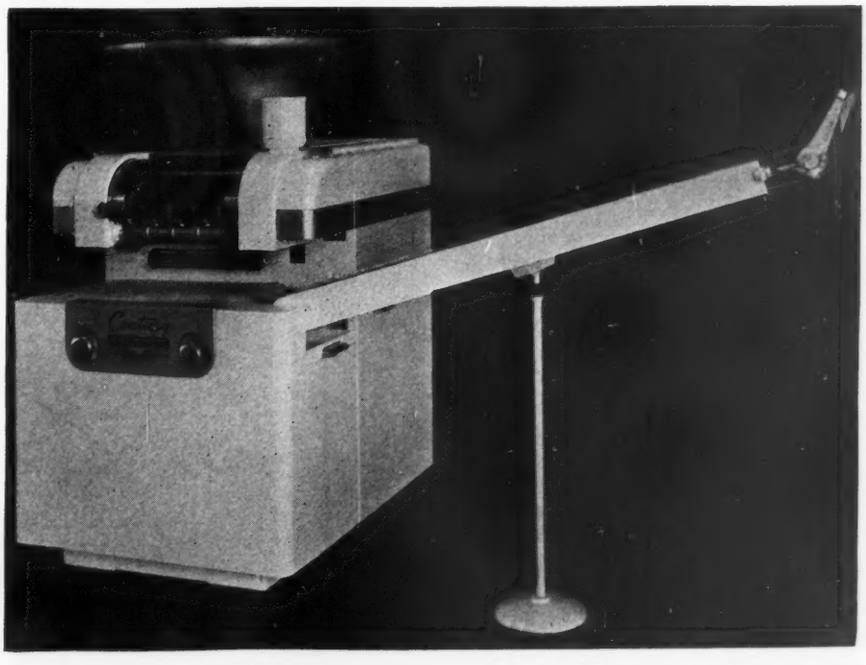
Mixing Equipment

A LINE of double ribbon mixing machines, designed for fast and efficient mixing of materials ranging from dry powders to heavy viscous pastes, has been brought out by H. K. Porter Co., Inc., 4941 Harrison St., Pittsburgh, Pa. In these mixers, two metal ribbons of spiral design attached to a central shaft, create a double folding action on the materials being mixed. A jacket is provided for heating or cooling. The motor is mounted on the same base as the machine. These mixers are available in any capacity from laboratory to large production sizes and can be fitted with any desired type of motor.

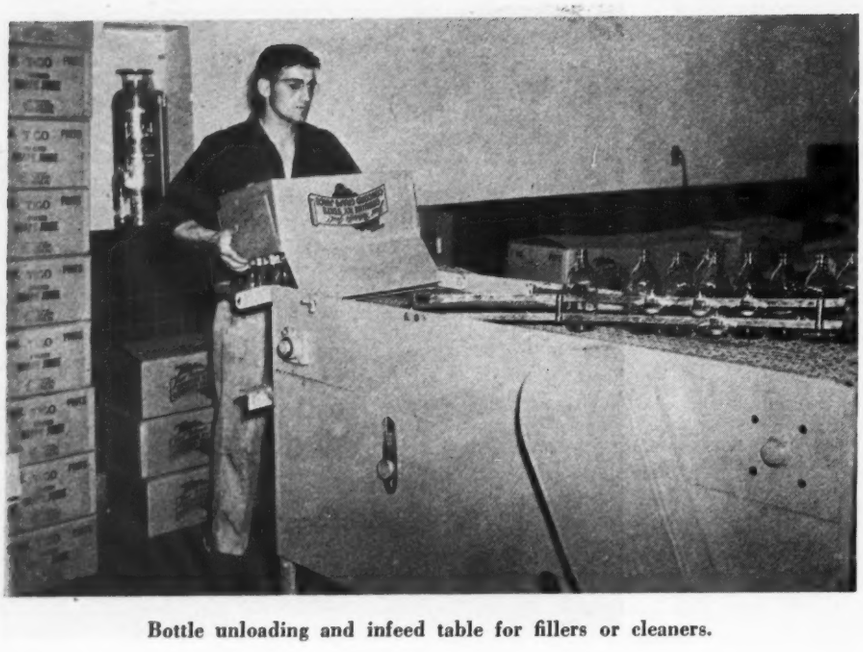
Double ribbon mixing machine.

Four-Pocket Dough Divider

CENTURY MACHINE CO., Cincinnati, Ohio, division of Baker-Perkins, Inc., has developed a four-pocket dough divider for which numerous improvements are claimed. The machine has a capacity of 4,200 pieces per hour. Movable parts that come into contact with the dough operate in mineral oil to prevent the dough from sticking to the mechanism. The dough, fed from an overhead hopper into dough boxes, is forced out onto an endless belt in four pieces, dusted with flour, and conveyed to the rounder. The entire operation is automatic. Ad-



Four pocket dough divider for bakeries.



Bottle unloading and infeed table for fillers or cleaners.

justments are provided to permit various sizes of loaves to be produced. By sliding the hopper out of position, the dough box is readily accessible for cleaning.

The machine is encased in a smooth white-enameled cover and has been designed to avoid projections or other places where dirt could accumulate. Controls are grouped at the front on a polished aluminum panel.

Insulation Material

JOHNS-MANVILLE, INC., 22 E. 40th St., New York, N. Y., has introduced L-W superex insulating material furnished in both block and pipe-covering forms. This new insulation is said to be a marked improvement in conductivity and strength for the service range of steam piping where temperatures are over 600 deg. It is also suitable for use with ovens, roasters and other industrial equipment where the temperature range is between 600 and 1500 deg. F.

Blocks are furnished 3, 6, 9, and 12 in. wide in standard lengths of 18 and 26 in. and in thicknesses of 1 to 4 in. Curved blocks are also available. Pipe insulation is available to fit standard pipe sizes in sections up to 3 ft. long and up to 2½ in. thick.

Bottle Infeed

WALTER MAGUIRE CO., INC., 330 W. 42nd St., New York City, has brought out a new design of bottle unloading and infeed table for use in bottle cleaning and filling installations. The purpose of this equipment is to enable one man to feed bottles at speeds up to 150 per minute in sizes from 4 to 32 oz., in installations where operation of the feed conveyor to the filler or bottle cleaner is continuous. These speeds are also possible with bottles from 12 to 32 oz. when operation of the feed conveyor to the filler or cleaner is intermittent.

As can be seen from the accompanying illustration, all that is necessary is for the operator to deposit a case load of empty bottles on the table. The machine then takes care of feeding these bottles one at a time to the conveying line. Where bottles are to be placed on a table by hand, one man can only place from 60 to 70 per minute and two were therefore required to reach maximum speed. When bottles are placed in this way, a case at a time, one man can carry out the operation.

Light Duty Trucks

FOR USERS of light delivery and light duty trucks, ranging in rated capacities from ½ to 1½ tons, International Harvester Co., Chicago, has brought out a new line of five models as follows: ½-ton Model K-1, ¾-ton model K-2, 1 ton model K-3, 1¼-ton model K-4, and 1½-ton model K-5. These trucks are available in various types of bodies for the three lighter models, including the panel delivery shown; and on the larger models, in cab-over-engine types for heavier service.

New light delivery truck.

Refrigerating Unit

WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J., has introduced centrifugal type refrigeration units in sizes from 150 to 650 tons capacity. In these units, speeds are relatively low, ranging from 4,000 to 5,400 r.p.m. and pressures do not exceed 15 lb., a safety factor resulting from the use of Freon-11 as the refrigerant. A feature is said to be an auxiliary oil pump, operating independently of the main drive, which furnishes full pressure lubrication to all bearings during the starting and stopping period. In starting, the main power can be applied only after the auxiliary pump has developed its full pressure and, in stopping, the auxiliary pump is automatically cut in as soon as the main power is shut off.

Tablets for Tomato Canning

COMBINATION TABLETS of calcium chloride and salt are being put out by the Scientific Tablet Co., 1520 Headley St., St. Louis, Mo., for use by tomato canners who wish to take advantage of the new canning method using calcium chloride to improve the firmness of the product. These tablets are available in three sizes: 30 grains, containing 24 grains of salt and 6 grains of calcium chloride, suitable for No. 2 cans of tomatoes; 45 grains, in the same proportion, suitable for No. 2½ cans of to-

matoes; and 75 grains, containing 60 grains of salt and 15 grains of calcium chloride, to be used, two each, for No. 10 cans of tomatoes.

Chocolate Melter

To MEET sanitary requirements of food processing plants and to provide quick processing and cleaning, L. O. Koven & Bro., Jersey City, N. J., has recently developed a new design of chocolate melter. While this specific melter was developed for use in an ice cream plant for the manufacture of chocolate coatings for ice cream, the manufacturer believes that other applications, where melting and mixing of food ingredients are required, will develop for the equipment. It is manufactured of stainless steel of high finish both inside and outside. The inside tank or container is

Stainless steel chocolate melter of sanitary design.

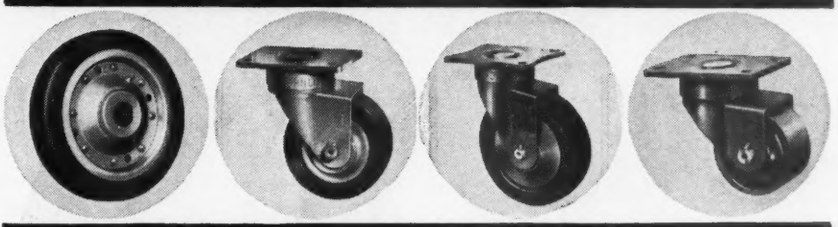
made of heavy gage metal and is provided with a sanitary outlet at the bottom. To keep the melting chocolate at uniform consistency and temperature, a stainless steel paddle agitator is provided inside the tank. The agitator, motor and motor supports are all designed for ready removal to facilitate cleaning.

Outside the inner container is a jacket for the circulation of heating medium. Around this is a blanket of insulation and outside of that a stainless steel sheathing. This melter can be built in any desired size or capacity.

Staticless Rubber

SPECIALIZED COMPOUNDS of natural rubber and synthetic rubber with a high de-

They are Different & Better



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Where WEATHER is *Made to Order . . .*

Here, at the heart of a modern air conditioning system, Mundet Moulded Cork Pipe Covering insulates and protects the low temperature pipe lines from heat infiltration • Mundet Cork Pipe Covering is made of 100% pure cork, which, due to its low conductivity, holds power costs to the minimum. Its high efficiency permits precise control of low temperature regardless of climate or season • Cold lines, low-temperature ducts, the walls, floors and ceilings of refrigerated rooms should be adequately protected by Mundet Cork Insulation in the form of Cork Pipe Covering and Corkboard • For test data, showing what Mundet Cork Insulation can mean in savings and operating efficiency, write to Mundet Cork Corporation, Insulation Division, 65 S. Eleventh St., Brooklyn, N. Y.

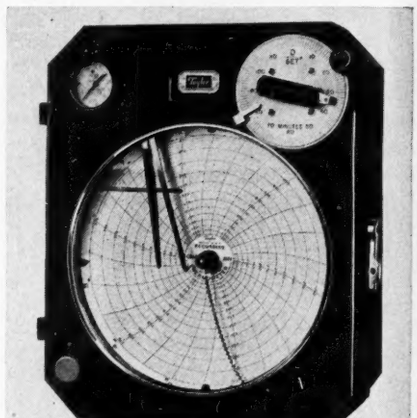
MUNDET CORK INSULATION

• CONSERVES LOW TEMPERATURE •

gree of electrical conductivity have been developed by B. F. Goodrich Co., Akron, Ohio. This company announces that it can now furnish solutions of synthetic rubber that can be applied to the surfaces of natural rubber products and which will carry away static. This material has had successful application as a belt dressing for carrying away static from transmission belts.

Process Timing Mechanism

TAYLOR INSTRUMENT COS., Rochester, N. Y., has developed a process timing mechanism for use with its recording controllers. This mechanism is said to assure exact duration of batch processing operations such as the retorting of canned foods. In operation, the process is manually started by adjusting the instrument for desired time period. The timing then automatically starts, not immediately, but when the apparatus

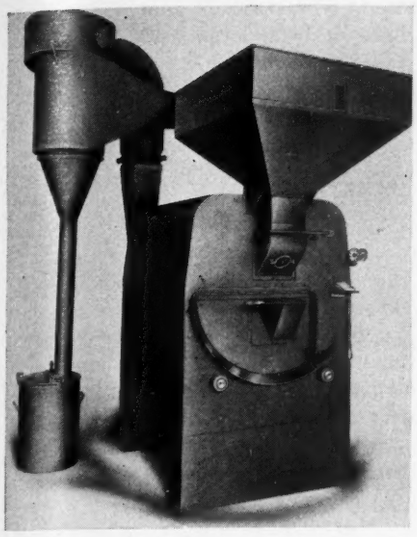


Process timing mechanism for use on recording controllers.

reaches the set point of the controller. The length of time required to reach this set point makes no difference in the operation. At the end of the desired period, the mechanism automatically terminates the process. To facilitate the timing of successive batches of the same duration, a "stop" is furnished on the timing mechanism dial. With this "stop" set to the desired timing period, the pointer can be quickly spun to the "stop" and the starting of each operation speeded up.

Batch Peanut Roaster

JABEZ BURNS & SONS, INC., 11th Ave and 43rd St., New York, has brought out the No. 33 Thermalo roaster for shelled peanuts. This is a small batch machine designed to apply the low temperature principal of roasting that is embodied



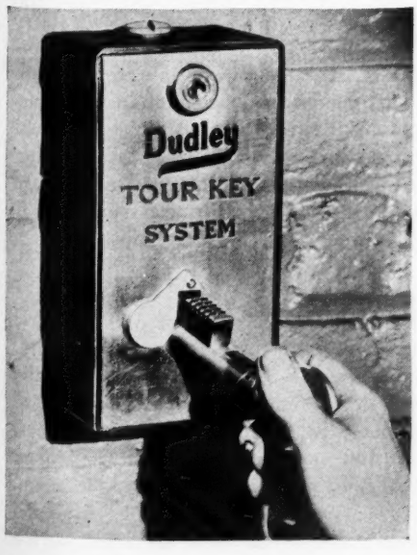
No. 33 Batch roaster for shelled peanuts.

in the older and larger Thermalo machine used by large producers for continuous work.

This No. 33 roaster will produce 500 lb. per hr. of peanut butter stock roasted to any desired degree. It is designed for gas fuel and is equipped with a premix burner for efficient combustion. A 2 hp. geared motor drives the roaster cylinder while an additional 1 hp. motor drives the recirculating fan.

Watchman's Tour System

DUDLEY LOCK CORP., 325 N. Wells St., Chicago, has developed a new watchman's tour system that is said to be adaptable to every size and kind of industry. This system is designed to establish complete control over the watchman's activities and to protect him in case of mishap. It compels the inspection of specific parts of the property at prescribed time intervals and can flash or permanently record the time of inspection and can summon aid in emergencies.



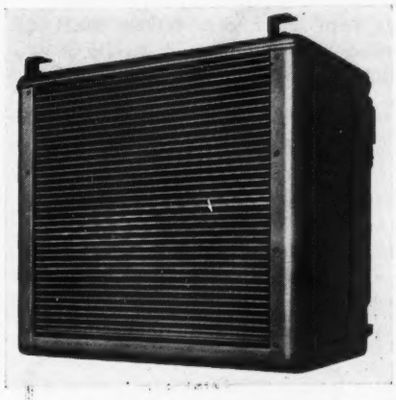
Key and station of watchman's tour system.

The system comprises a series of key stations with transmitting stations at the start and finish of each series. The transmitting stations can actuate any kind of signal or recording apparatus. A special recording clock used with this system records on a long roll of paper the date and the exact time each transmitting station is visited. An additional service is the delayed alarm which gives warning of any specific location when a transmitter box is not visited within a given time.

The watchman's key is small enough to be easily carried in the pocket. It is a combination of three separate locks, operating only on a predetermined route and in proper sequence. It has a built-in cyclometer which counts the stations visited and thus gives proof of completion of a specified number of tours.

Cold Diffuser

CARRIER CORP., Syracuse, N. Y., has brought out a cold diffuser for use in the refrigeration of perishables. This unit



Cold diffuser for the refrigeration of perishables.

is designed accurately to maintain predetermined temperatures, humidities and air circulation. It is of the suspended type, embodies an adjustable air grill which permits directional control and diffusion of the air, and has built-in heat interchangers. It operates on "Freon 12" or methyl chloride as a refrigerant, for which refrigerant six sizes are available. Four sizes for operation on ammonia or brine are also made. The units include propeller type fan and fan motor.

Hose for Food Plants

TO OVERCOME THE DAMAGE experienced in using ordinary rubber hose for wash-up and other purposes in food plants,

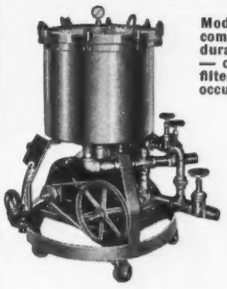
Get Brilliancy in your product free from foreign matter and sediment

WITH A CAPABLE

SPARKLER FILTER

You get faster results, save waste, and money with this compact, high capacity Sparkler Filter. You realize more uniform and better quality and make dependable separation of solids from liquids. Much simpler to keep clean.

Send for bulletins and prices on this and other models for filtering syrups, extracts, cider, vinegar, liquor, etc.

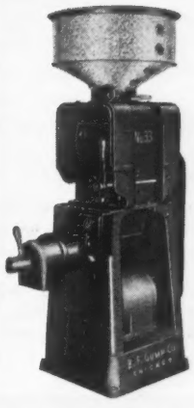


Modern streamline design combines strength and durability with light weight — offering large capacity filters on portable stands—occupying minimum floor space affording minimum adaptability. A modern filter for modern processing—with its numerous demands for unqualified brilliancy and purity. Cloudiness implies impurity—sediment bespeaks inferiority. Capacities—50 to 1,000 gal. per hour.

SPARKLER MFG. CO.

1210 Webster Avenue, Chicago

Uniform grinds



ARE AN IMPORTANT FACTOR IN OBTAINING UNIFORM BREWING RESULTS

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THE NO.

33

The No. 33 Gump Coffee Granulizer is just the machine for producing those uniform coffee grinds that are in so much demand to-day. Adjustable from pulverized to medium coarse sizes and suitable for grinding up to 700 pounds per hour. Larger Granulizers with capacities up to 4000 pounds per hour also available.

Catalogs On Request

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TESTED OAKITE CLEANING

..helps you control Quality

CHEESE factories, meat packing, confectionery, canning and other food plants using Oakite materials year after year tell us that tested Oakite cleaning helps them more easily maintain sanitary standards . . . helps them control product quality more effectively . . . helps keep cleaning costs low!

Why? Because, first of all, Oakite materials are SAFE to use on equipment, whether it be aluminum, stainless steel, nickel, Monel metal, copper, tinned or glasslined. Equally important, these dependable, time-tested materials clean THOROUGHLY and QUICKLY. Furthermore, they are FREE-RINSING! As a result, the subsequent germicidal treatment where required by regulations, is made more certain, more effective in safeguarding product against contaminating bacterial organisms.

Make This Test Today!

Decide now to test Oakite cleaning in your plant. For whatever product you pack in tin or glass . . . vegetables, fruits, sauces, condiments, soups, beverages, sea food . . . the recommended Oakite material will help you clean faster, more thoroughly, at lower cost! Write for money-saving data on your cleaning problems. No obligation.

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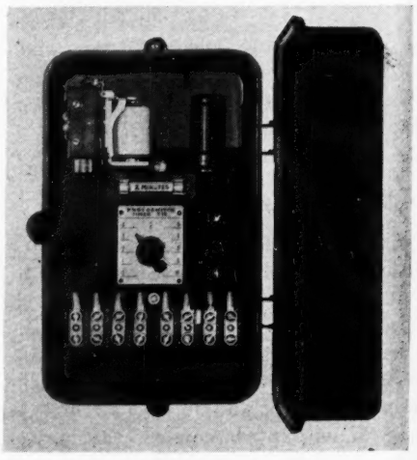
where fats and oils ruin the rubber, Hewitt Rubber Corp., Buffalo, N. Y., has placed on the market a new type of hose. This hose is provided with a synthetic rubber outer cover which is said to be as tough and pliable as natural rubber but resistant to the action of fats and oils. In addition, this synthetic rubber is odorless, thus avoiding the objection to some other types of synthetic products which have been used for this purpose previously. The manufacturer claims that this new hose will last two or three times as long as ordinary hose when used in wash-up service in plants where it is exposed to fats and oils. The hose is white, in order that it may be kept more easily in a sanitary condition.

Short Interval Timer

PHOTOSWITCH, INC., 21 Chestnut St., Cambridge, Mass., has developed a short interval timer, Type T-15, designed to give accuracy over ranges from 1/20th of a second up to 2 minutes. With this timer, control is accomplished by means

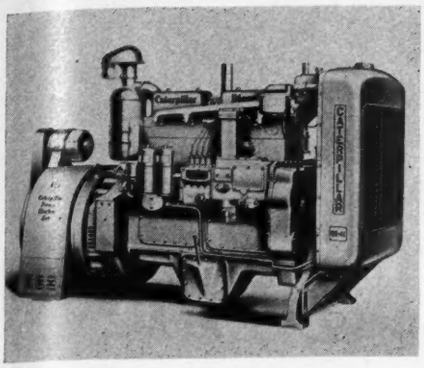


Short interval timer.

of a snap-action relay of 1,000 watt capacity. The equipment can be used with both momentary push-button and sustaining contact control. It is designed for six timing ranges, the change being made by means of timing valves that are snapped into a readily accessible clip.

Diesel Electric

TO ROUND OUT its line of diesel electric sets, Caterpillar Tractor Co., Peoria, Ill., is now making two new models, the 88-41 and the 77-34. Both units are powered by four cylinder diesel engines, the first developing 41 kw. at 900 r.p.m. and the second 34 kw. at 900 r.p.m. Above ratings are for units equipped with fans. When fans are omitted, the ratings are slightly higher.



New small diesel electric generating sets.

These sets are completely self controlled, requiring no other extra equipment except a circuit breaker. In-built regulation is provided to pick up relatively large motor loads with minimum of light flicker or voltage drop.

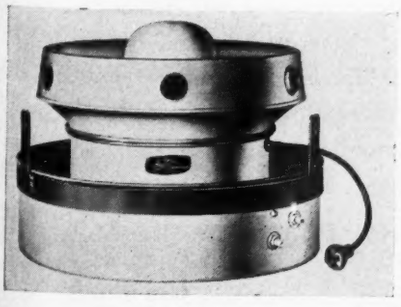
Safety Covers for Gages

ASHCROFT DIVISION, Manning, Maxwell & Moore, Inc., Bridgeport, Conn., has developed plastic "Durafronts" safety covers for gages. The purpose of these covers is to eliminate all possibility of injury to workers in case of broken glass. The fronts are molded from crystal-clear plastic of high tensile and compression strength.

Industrial Humidifier

WALTON LABORATORIES, INC., 1186 Grove St., Irvington, N. J., has introduced an industrial humidifier of larger capacity than standard humidifying units made by this company. This device has capacity for vaporizing about 1 gal. of water per hour. The atomizer unit is driven by a ball-bearing motor requiring only 100 watts electrical input. Brackets for ceiling suspension are provided and the unit can be hung close to the ceiling without danger of the falling of free moisture.

A tank provided in the unit is equipped with an adjustable float valve and overflow outlet. Connection to the water main is provided for.



Humidifier for industrial plant.

YOUR "FAMILY FLOUR" TRADE

Housewives are becoming more and more particular about the condition of flour they use.

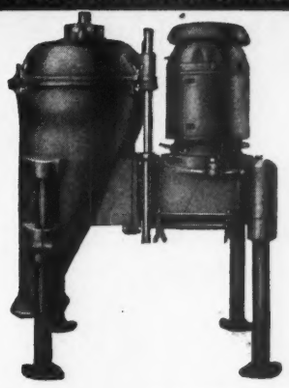
Most women don't return insect infested flour to the grocer, they discard it with the thought.

"I'LL NEVER BUY THAT FLOUR AGAIN"

The intangible losses — the ones you never hear about — are much worse than those where your flour is actually returned for replacement or is confiscated.

ENTOLETE *your flour*

DESTROY INSECT INFESTATION AS PART OF THE MILLING PROCESS



The Bulk Flour **ENTOLETER** INFESTATION DESTROYER

DESTROYS ALL INSECT LIFE IN ALL STAGES: EGG, LARVA, PUPA AND ADULT *MECHANICALLY*. IT IS INEXPENSIVE, EASY TO INSTALL AND OPERATE AND REQUIRES A MINIMUM OF MAINTENANCE.

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We don't know *all* the answers but, considering that our experience in designing and building process machinery goes back 40 years, it stands to reason that we can show you how to do it faster, better, cheaper . . . For information on the equipment that gets things done for less money just check and mail the coupon below.

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Kindly send particulars on your equipment

for ..... **(process)** .....**(material)**

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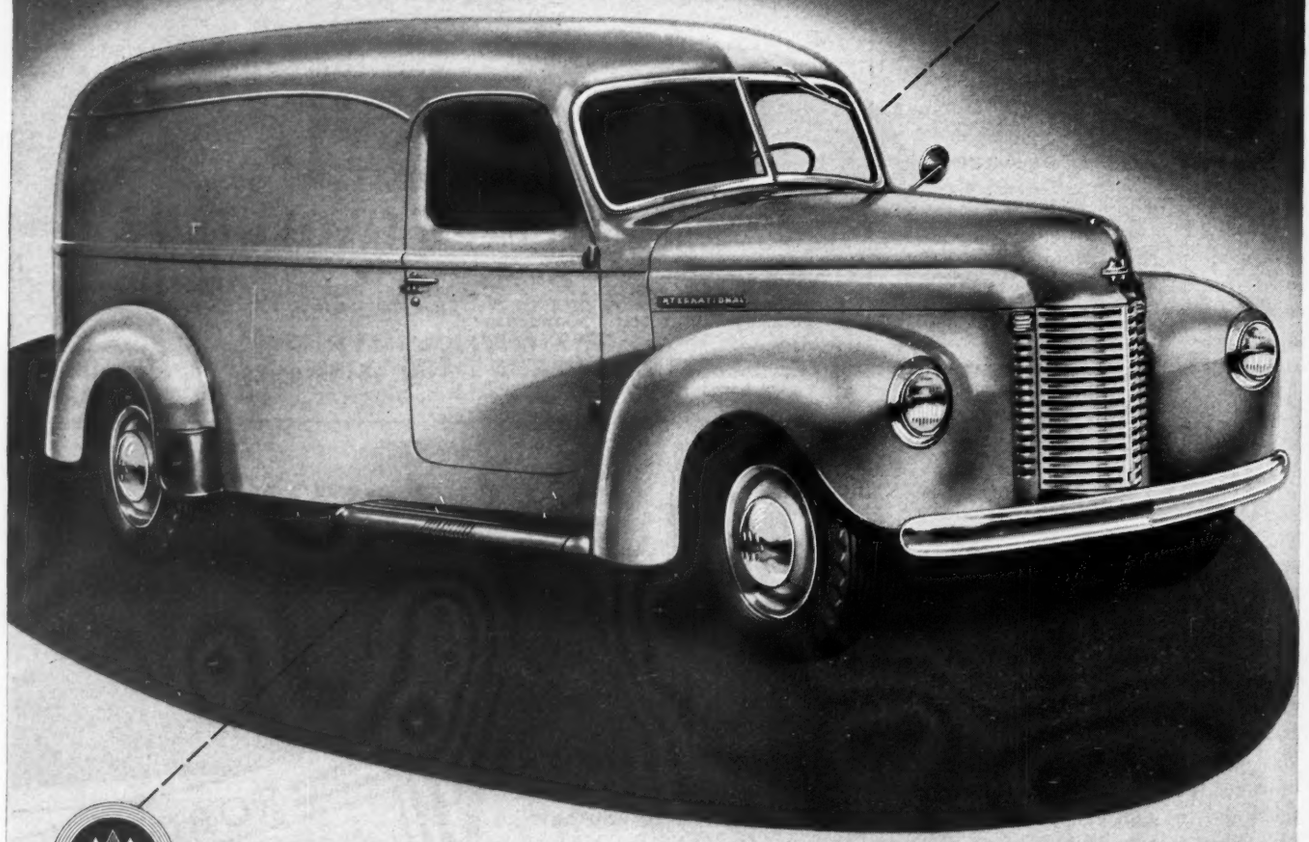
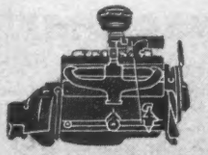
THE *New* INTERNATIONAL TRUCKS*



All-Truck Trucks *Better Than Ever!*

International Harvester is proud to present "The New Internationals"... beautiful in appearance, powered beyond requirements, engineered for unbeatable economy.

The heart of the remarkable economy in all the light-duty models is the new International-built Green Diamond Truck Engine...exclusively International.



The new Green Diamond Engine

The smooth performance of this power-giant, plus its sensational low-cost operation, make these new K-Line Internationals big money-savers on any hauling job.

There are new double-anchor hydraulic brakes; long, easy-riding springs; sealed-beam headlights; safety glass throughout; a new all-steel Safety Comfort-Cab; and many other features.

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BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

Air Conditioners
A specification sheet covering four sizes of Type 50-M self-contained air conditioning units has been issued by Carrier Corp., Syracuse, N. Y.

Air Conditioning
A simplified presentation of air conditioning data by means of charts, also tables giving vapor pressures, are contained in Bulletin AC-127 issued by Carrier Corp., Syracuse, N. Y.

Candy Equipment
Advantages of the use of sheet Monel metal in the fabrication of equipment used in candy manufacture are briefly discussed in a data of the International Nickel Co., 67 Wall St., New York, N. Y.

Confectionery Kettles
The advantages of Monel metal as a material for fabricating jacketed kettles for candy manufacture are discussed in a recent leaflet issued by the International Nickel Co., 67 Wall St., New York, N. Y.

Dehumidifier
A leaflet describing self-contained dehydrators for use in drying or dehumidifying operations, employing the Silica Gel method, are described in a publication of Carrier Corp., Syracuse, N. Y.

Materials Handling
"Cost Finding Records for Conveyor Belts" a book containing instructions and record sheets for keeping a record on the cost of using conveyor belting, has been issued in a new edition by B. F. Goodrich Co., Akron, Ohio.

Materials Handling
Savings effected through the use of the "Acme Skid-Load Process" in materials handling are set forth in booklet Form AD18 of Acme Steel Co., 2840 Archer Ave., Chicago, Ill.

Mixing Equipment
The full line of "Pneumix" air-motored agitators is described in a 4-page folder issued by Eclipse Airbrush Co., 390 Park Ave., Newark, N. J.

Mixing Equipment
In a bulletin entitled "Big Batch Mixing", a 340-qt. vertical mixing machine is described and illustrated by American Machine & Foundry Co. of 511 Fifth Ave., New York, N. Y.

Refrigerating Unit
Type AV, multi-cylinder V-type compressor units for refrigeration, from 5 tons to 60 tons capacity, are described and illustrated in 4-page bulletin No. 700-A of Frick Co., Waynesboro, Pa.

Separating Screens
Typical installations for handling such material as fish products, asparagus and vegetable refuse for the separating of solids from liquids by means of vibrating screens, are discussed in Folder 1877, issued by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

Spraying Equipment
Spray nozzles, guns, atomizing heads, air washers, spray cooling systems and humidifying systems are illustrated and described in a catalog entitled "Spray Engineering" issued by Spray Engineering Co., 114 Central St., Somerville, Mass.

Traveling Oven
Flat traveling hearth ovens for bread-baking are described in a 4-page illustrated circular issued by the Oven Div., American Machine & Foundry Co., New Haven, Conn.

Yeast Culture Apparatus
Equipment for pure yeast culture, made of stainless steel, is described and its application discussed in a recent bulletin of Schwarz Laboratories, Inc., 202 East 44th St., New York, N. Y.

Plant Accessories and Supplies

Artificial Rubber Equipment
The effect of vegetable and animal fats and oils on the artificial rubber called "Neoprene," as compared to the effect of these materials on rubber, are considered in a bulletin entitled "The Neoprene Notebook No. 26" published by E. I. duPont de Nemours & Co., Inc., Wilmington, Del.

Belt Fasteners
Rip plates and fasteners for use in the joining and repairing of conveyor belts are described in Bulletin F 100 issued by Flexible Steel Lacer Co., 4607 Lexington St., Chicago, Ill.

Blower
Single-stage turbo-blowers for delivering large volumes of air pressures up to 6¼ lb. per sq. in., are described in Bulletin B-6048, a 24-page illustrated publication of Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Building Material
"Por-Ce-Lok," a porcelain enamel roofing and siding for use in the construction of industrial buildings, is described in a recent bulletin of Porcelain Steels, Inc., Cedar & Ashland Road, Cleveland, Ohio.

Deaerating Heater
In Bulletin No. 2357, a 12-page illustrated publication, a new type of deaerating water heater for use with all types of water treating plants in heating and deaerating boiler feedwater has been issued by the Permutit Co., 330 W. 42nd St., New York, N. Y.

Diesel Engines
Stationary diesel engines of the four-cycle, direct injection type from 250 to 665 hp. are described in Bulletin S-500, G-38, published by Worthington Pump and Machinery Corp., Harrison, N. J.

Electrical Equipment
Pyranol capacitors for improving power factor in low-voltage industrial applications are the subject of Bulletin GEA-3742A, published by General Electric Co., Schenectady.

Feedwater Regulator
Bulletin No. 429, describing the Copes "Flow-matic" regulator, a two-element steam flow type boiler feed water regulator, has been issued by Northern Equipment Co., Erie, Pa.

Heating Equipment
Various types of heating equipment are described in the following bulletins: GEA-214D, describing calrod immersion heaters for water and oil; GEA-1157C, describing strip heaters and their installation; GEA-104B, describing cartridge type heating units; GEA-2618A, describing fin calrod heating units for forced convection air heating; GEA-1365D, describing thermostats for use with midget heating units; GEA-2592A, describing unit heaters of the forced and natural convection type; all issued by General Electric Co., Schenectady, N. Y.

Lighting Equipment
"Handbook and Data Bulletin on Fluorescent Lighting" is a 46-page selection of charts, diagrams, tables and photographs on where and how to use fluorescent lighting, published as Bulletin No. 40 by Benjamin Electric Mfg. Co., Des Plaines, Ill.

Lubrication
As an aid to the choice of correct lubricant for ball bearings, a 15-page booklet entitled "Lubrication of Ball Bearings" has been issued by New Departure Div., General Motors Sales Corp., Bristol, Conn.

Motor Control
Polarized field frequency automatic control for synchronous motors is described and illustrated in publication 159 of Electric Machinery Mfg. Co., Minneapolis, Minn.

Pumps
"The Effects of Water Conditions on the Selection of Pump Materials" is the title of a bulletin issued by Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Pumps and Compressors
In a handsome illustrated 80-page publication entitled "100 Years", the history and the equipment of Worthington Pump and Machinery Corp., Harrison, N. J., are featured and described.

Short Center Drives
Texrope belts, sheaves and other equipment used in Texrope drives, together with revised horsepower ratings, are the subjects of Bulletin No. B-6062-A of Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Shut-off Valve
A line of ¼ and ⅜ in. quick-operating shut-off valves for small air, gas and cold-water lines is the subject of a new leaflet published by Homestead Valve Mfg. Co., Coraopolis, Pa.

Speed Reducers
Information on a complete line of herringbone gear reducers is contained in Book No. 1519A published by Link-Belt Co., 307 N. Michigan Ave., Chicago.

Stainless Steel
Various steels for fabrication of processing equipment, made of stainless, non-tarnishing, chemical and heat-resisting alloys, are described in a recent folder of Jessop Steel Co., Washington, Pa.

Stainless Steel Tubing
Welded stainless steel tubing and its application in food processing equipment and elsewhere, together with full specifications, are given in the new welded stainless tube data book of Carpenter Steel Co., Kenilworth, N. J.

Steam Traps
The "Discharger", a positive acting trap of special design for handling large quantities of condensate at relatively high pressure, is described in publication 2935 of Cochrane Corp., 17th and Allegheny Ave., Philadelphia, Pa.

V-Belt Drives
A 170-page illustrated bulletin entitled "V-Belt Data Book", giving information as the belt requirements for driving processing equipment, pumps and refrigerating equipment, also giving specifications for belts, has been issued by B. F. Goodrich Co., Akron, Ohio.

V-Belt Drives
A 65-page engineering manual giving complete specifications and application information for "Multi-V-Drive" V-belt drives, numbered as Engineering Manual V-1400-E2 404, has been issued by Worthington Pump & Machinery Corp., Harrison, N. J.

Vertical Motors
Vertical solid shaft induction motors, vertical hollow shaft induction motors, and single-phase vertical motors are described, respectively, in Bulletin GEA-1412B, GEA-1368G, GEA-3223, all of which have been issued by General Electric Co., Schenectady, N. Y.

Water Softening
A 32-page illustrated treatise on the hot lime-soda water softening process, and equipment used therewith, has been issued as Bulletin No. 2341 by the Permutit Co., 330 West 42nd St., New York, N. Y.

Water Treatment Equipment
Bulletin 2345, describing a dry chemical feeder for use in water treatment systems, has been issued by The Permutit Co., 330 West 42nd St., New York, N. Y.

Welding Stainless Steel
"The Welding of Republic Enduro Stainless Steel" is the title of a 20-page booklet, Form ADV373, put out by the Republic Steel Corp., Cleveland, Ohio.

Packaging

Coffee Bags
A 36-page bulletin illustrated in color and entitled "A Complete Coffee Bag Encyclopedia" shows designs of "Flav-O-Fresh" stock design coffee bags made by Continental Bag Specialties Corp., 27th St. and Hudson River, New York.

Container Cleaners
Four types of air cleaners for cleaning bottles and glass containers prior to filling are briefly described in a recent leaflet of the Karl Kieffer Machine Co., Cincinnati, Ohio.

Packaging
"How to Seal Corrugated Shipping Boxes", the 2nd edition of a popular handbook on various methods of carton sealing, has been issued by Hinde & Dauch Paper Co., Sandusky, Ohio.

Packaging
"Sealing of Corrugated and Solid Fiber Containers" is the title of the second edition of a revised booklet on that subject issued by Robert Gair Co., 155 East 44th St., New York, N. Y.

Trucks & Tractors

Truck Insulation
A 4-page bulletin describing the new "Dry-Zero Bound-Batt" insulation for refrigerated and other low-temperature truck bodies has been issued by Dry-Zero Corp., 222 N. Bank Drive, Chicago.

Control Equipment

Control Instruments
Indicators, recorders and controllers of both self-contained and portable models for the control of temperature and pressure are illustrated and described in Catalog No. 6705 issued by Brown Instrument Co., Wayne and Roberts Aves., Philadelphia, Pa.

Control Instruments
Pressure reducing and desuperheating control of air-operated type is illustrated and explained in Bulletin No. 107A, Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland.

Control Instruments
Indicating, recording and controlling instruments for temperature, pressure and humidity applications in the food industries are described in Bulletin No. 242, Foxboro Co., Foxboro, Mass.

Electronic Devices
In a 20-page illustrated booklet entitled "Electronic Devices for Industry" the General Electric Co., Schenectady, N. Y., lists some of the important vacuum tube apparatus which it manufactures, together with application and operation information.

Liquid Level Control
Equipment for five different methods of liquid level control, together with specifications, is given in Publication 2939 of Cochrane Corp., 17th and Allegheny Ave., Philadelphia, Pa.

pH Instruments
In Bulletins 910E and 910T, Cambridge Instrument Co., 3732 Grand Central Terminal, New York, N. Y., describes the electron-ray pH meter and the thermionic pH recorder.

Temperature Indicator
A portable potentiometer-pyrometer for indicating temperature in ranges from sub-zero to 3,000 deg. F. is described in Bulletin 540-70-C0, issued by J-B-T Instruments, Inc., 441 S. Chapel St., New Haven, Conn.

Laboratory Equipment

Dairy Microscopes
Milk plant microscope outfits specifically developed for use by the dairy industries are briefly described in a 4-page leaflet of Bausch & Lomb Optical Co., Rochester, N. Y.

Laboratory Equipment
Detailed specifications and performance data on a line of thermostatically controlled electrically heated constant temperature laboratory equipment is included in 24-page illustrated bulletin 315 published by Precision Scientific Co., 1750 N. Springfield Ave., Chicago, Ill.

Laboratory Equipment
A standard test laboratory air conditioner, embodying all the functions of a complete air conditioning system, is described in Bulletin 50J-15 of Carrier Corp., Syracuse.

Food Ingredients

Starch for Pie Bakers
In two booklets the use of specially prepared starches in pie fillings is discussed by National Starch Products, Inc., 820 Greenwich St., New York, N. Y.

Vitamin D
Vitamin Technologists, Inc., 947 Maple Ave., Los Angeles, Calif., have issued a new 16-page bulletin on V.C.I. process Vitamin D for use in fortification of foods.

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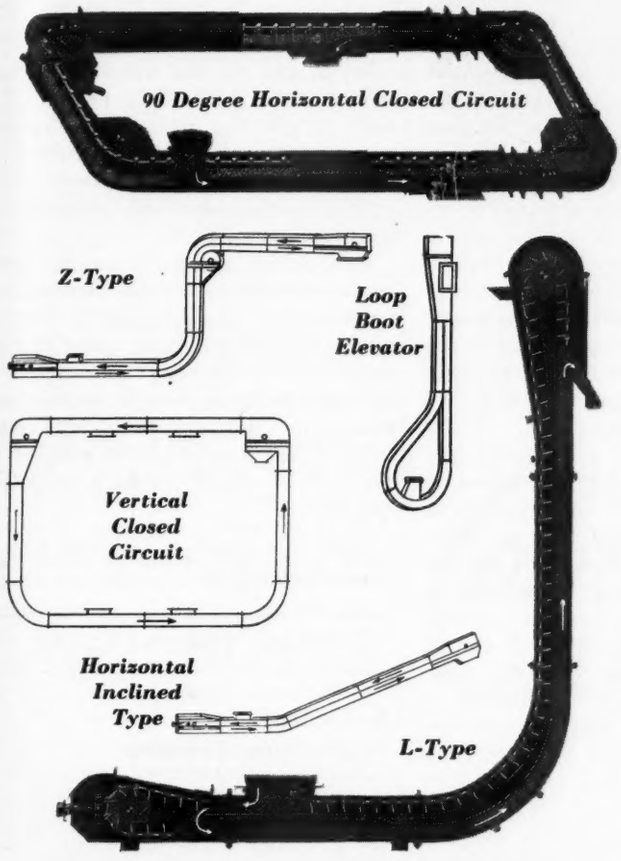

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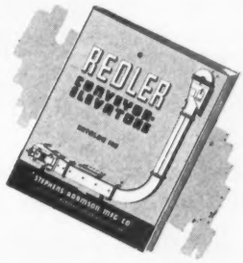
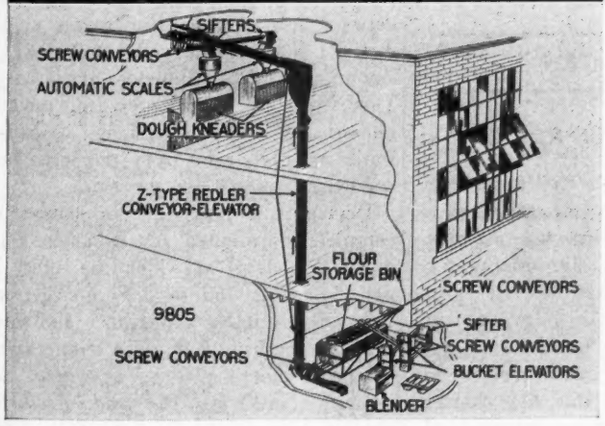


FOOD PLANT MODERNIZES WITH SINGLE Z-TYPE REDLER CONVEYOR-ELEVATOR



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Food Technology

NEW DISCOVERIES & INVENTIONS

FOOD TECHNOLOGY

O-phenylphenol For Citrus Fruit Wrappers

WRAPS containing 0.44 percent (calculated on the weight of paper) of o-phenylphenol gave considerable protection to oranges and lemons against *Penicillium digitatum, Penicillium italicum* and *Trichoderma lignorum.* The stated concentration, amounting to 9 mg. of antiseptic per square foot of paper, is about all that can be tolerated without injury to the rind. Lemons are more resistant to injury than oranges, which need some additional treatment of the wrap to protect the rind from the antiseptic. It was found that if the wrap is impregnated with a fatty oil, such as peanut or olive oil, more o-phenylphenol can be use without injury to the rind. The oil apparently does not impair the potency of the antiseptic. With lemons the extra cost of oiling the wrappers is not justified, except for less resistant lemons such as tree-ripened fruit. But for oranges this added protection is necessary. Tests show no effect of the antiseptic on texture of the fruit, weight loss in storage or susceptibility of lemons to red blotch.

Digest from "Use of Wraps Containing O-phenylphenol for Citrus Fruits," by J. E. van der Plank, J. M. Rattray and G. F. van Wyk, *Journal of Pomology and Horticultural Science* **18**, 135, 1940 (Published in England).

Perishables Stabilized By Homogenization

A METHOD of stabilizing a mixture of fresh eggs, liquid milk, shortening, salt and sugar against bacterial or fungicidal spoilage without heat sterilization or use of refrigeration is disclosed in U.S. Patents Nos. 2,197,820 and 2,211,678 granted to Wm. R. Voss, Milwaukee, Wis.

When finished, the mix contains approximately 60 percent total solids and is in a highly dispersed state. Sugar in solution makes up at least 30 percent of the total mix, and the fat is so finely dispersed by homogenization that its globules are 2 microns or less in diameter.

To increase its fluidity by lowering the viscosity of the sugar solution and melting the shortening constituent, the mix may be run through a standard dairy pasteurizing unit at a temperature ranging between 85 to 160 deg. F. The pasteurizing action is incidental. Selection of temperature should be on the basis of economical and practical operation of the homogenizer. Although egg whites are heat sensitive and generally begin to coagulate at approximately 120 deg. F., they are described as not being materially affected when heated to 160 deg. F. in this high-sugar mix.

While a dairy type homogenizer may be regarded as standard equipment to get the desired degree of dispersion of the fat particles, colloid mills and other types of emulsifying equipment may be used. The essential factor of effectiveness is that the degree of dispersion is sufficient to give fat globules of 1 to 2 microns diameter; many, many times smaller than normal milk butterfat particles.

Since the finished product is for use in the making of bakery products, frostings, icings, fillings and confections, it is intended to withstand the rigors of non-refrigerated transportation and storage, handling in the factory or home in opened and partly emptied containers, and passage of time under ordinary climatic conditions.

BEVERAGES

Simple Way To Get Red Wines

SINCE the color of grapes used in making red wines is mostly in the grape skin rather than in the juice, the pigment must be released from the skin if the wine is to have the desired full red color. In making dry wines the grapes are in contact with their skins three to six days, and fermentation conditions suffice to bring out the color. But the shorter contact time in making sweet red wines is often insufficient for full color development.

Of the grapes commonly used in California, only Alicante Bouschet is dependable for color, but its flavor and certain other factors are against it. Petite Sirah grapes can be manipulated to give full color, in any but the warmest seasons, and usually Zinfandel grapes can be made to give full color. But a simple treatment is needed for driving the pigment from skin to pulp so that it will appear in the juice and utimately in the wine.

Various heat and gas treatments were tested experimentally. An effective and satisfactory method was found to be dipping the whole grapes in nearly boiling water (203 to 208 deg. F.) from 1 to 3 minutes. Musts of treated samples contain more color, sometimes more than twice as much as untreated samples at the time of normal pressing for sweet red wine.

Digest from "Color in California Wines," by M. A. Amerine and Wm. de Mattei, *Food Research* **5**, 509, 1940.

FOOD ENGINEERING

Reduces Drying In Air Blast Freezing

A SEEMINGLY minor point which proved to be a major factor in limiting fish freezer design is the faster rate of drying caused by forced air circulation in the ordinary sharp freezer for fish. Forced circulation is important for heat transfer, but the vapor pressure gradient between fish entering the freezer at 32 deg. F. and freezing coils at 0 deg. F. amounts to 3.623 millimeters of mercury. This drop in vapor pressure, though numerically small, is sufficient to cause water to evaporate from the fish and condense (freeze) on the coil.

Drying in a sharp freezer cannot be completely prevented, but it can be kept down to a level at which the effect is not noticeable and so does not detract from the attractive appearance and salability of the fish. *For given temperature conditions there will be a critical air velocity above which the product will be damaged by drying.* For the fastest air flow attainable without excessive drying the initial temperature should be low, with ample cooling coil surface and compressor capacity, with even temperature distribution throughout the freezer.

An experimental freezer was modified to provide these conditions by shutting

off the corridor with a plywood enclosure across the front of each side of the freezer, since air circulation is not needed in the corridor. Plywood dampers at the air intake end permitted equalization of airflow on the various shelves. The modified freezer, three quarters full of black cod, with a few hundred pounds of halibut of various sizes, froze the fish completely in 13 hours, 30 minutes, as compared with 18 hours, 20 minutes in the ordinary sharp freezer. The experimental freezer permitted successful use of forced air circulation without damage by drying.

Digest from "Freezer Studies, 11," by O. C. Young, *Progress Reports of Pacific Biological Station and Pacific Fisheries Experimental Station.* No. 45, p. 7, 1940 (Published in British Columbia).

CANNING

Spoilage of Acid Canned Fruit

SINCE THE mildest permissible cooking conditions are desirable for preserving color, flavor and texture of acid canned fruits, tests have been made to ascertain the minimum safe sterilization time and temperature. The superior keeping quality of commercial packs using unbuffered water sirup, as compared with fruit packed with highly buffered pineapple juice sirup, led to a comparison. Neither water sirup nor juice sirup gave freedom from swells in less than 20 minutes sterilization time, but the type of swells indicated that water sirup gave a closer approach to sterility than did juice sirup. This was confirmed by heating until sterility was reached; water sirup packs were sterile in 21 minutes while juice sirup packs took 25 minutes.

The influence of temperature depends partly on acidity. When the acidity is at 4 on the pH scale, temperatures well below 190 deg. F. will give sterility, but not in every case. In packs sterilized at temperatures up to 180 deg. F., some swells occur (two arrested swells out of 50 cans in one case). But no swells were obtained in packs sterilized at 190 deg. F. When acidity of can contents was decreased by adjusting the acidity of the sirup or by canning less acid fruits, it was found that higher sterilization temperatures were required. Thus when acidity was lowered from 4 to 4.5 on the pH scale (higher pH levels correspond to lower acidities), the lowest safe temperature was 200 instead of 190 deg. F.

The organism causing spoilage is also an influential factor, and it was found that pH 4.5 is a critical acidity for butyric spoilage. At higher acidities (pH values below 4.3) no butyric swells occur but, if pH rises above 4.5, the

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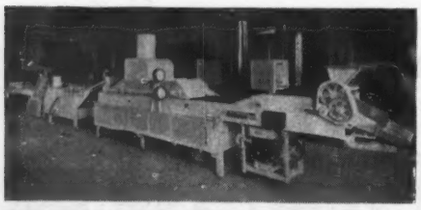

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higher sterilization temperature is necessary. Some spore forming and non-spore forming bacteria were also tested. Fancy sliced pineapple from commercial packs was on the safe side for butyric spoilage, ranging in pH from 3.6 to 4.4, and in general most fruits for canning have pH values below 4.5. For control purposes in the cannery the essentials are to keep the final pH at or below 4.4, and to sterilize at 190 deg. F. or higher.

Digest from "Factors in Spoilage of an Acid Canned Fruit," by C. H. Spiegelberg, *Food Research* **5**, 439, 1940.

CEREAL PRODUCTS

Enzyme Control In Cereal Products

DEGRADATION of proteins in wheat and other cereals during the processes of milling, baking and feed manufacture can be controlled by use of an inhibitor which is much more effective, weight for weight, than potassium bromate. As disclosed in Dutch Patent 48,184 (granted April 15, 1940, to L. Elion, Amsterdam, now in Larchmont, N. Y.) this inhibitor of enzyme action is iodine trichloride. It serves to prevent such proteolytic enzymes as papain, bromelin and cathepsin from degrading the proteins of grain. As an example, 10 p.p.m. of iodine trichloride in wheat flour (10 mg. in 1 kg. of flour) gave a better loaf than was obtained from flour containing 30 p.p.m. of potassium bromate.

Swiss Arguments For Whole-grain Bread

WHEAT AND RYE should be baked as whole-grain breads, from the dietetic standpoint. The principal reason is that vitamin B_1 is lost in making white flour. This loss alone is a major cause of vitamin B_1 deficiency in modern civilized nations. Healthy adults enjoying a normal balanced diet should use whole-grain bread for at least half their bread supply. Children, pregnant women, persons engaged in heavy muscular labor and patients suffering from infectious diseases should use no other than whole-grain bread.

Other important dietary factors in whole-grain bread are vitamins A, B_2 and E; inorganic compounds supplying calcium, magnesium, phosphorous, manganese and iron; cellulose (for bulk) and certain flavor principles. For maximum preservation of dietary factors, old-style hard flat loaves are superior to modern crust bread with its soft, relatively moist interior. The hard loaves, such as Swedish rye bread, also retain delicate flavor principles better than do the softer breads.

Digest from "Problems of Physiologically Correct Bread Nutrition," by W. Kraft, *Schweizerische medizinische Wochenschrift* **70**, 913, 1940 (Published in Switzerland).

CONFECTIONERY

Plasticity of Chocolate Melts

CONSISTENCY of chocolate melts is a variable which candy manufacturers must keep under control, since it governs the thickness of chocolate coatings applied to confections. It happens that the flow of molten chocolate is neither of the purely viscous type nor of the purely plastic type. That is, chocolate is a pseudoplastic system. In truly viscous flow deformation begins as soon as any stress is applied to the system. In truly plastic flow there is no deformation until a certain minimum stress is reached. In both cases the flow, once started, is a linear function of the applied stress. In pseudoplastic flow, deformation begins as soon as any stress is applied but rate of flow is not a linear function of stress.

Flow of chocolate melts through a capillary tube under pressure gives results which prove the melts to be pseudoplastic systems. This is illustrated by data obtained in a simple capillary plastometer at 104 deg. F. The chocolate contained 37.6 percent fat. It was completely melted at 104 deg. F. It is evident from the figures that weight of chocolate extruded per minute is not directly proportional to the pressure.

Cm. Hg	Pressure Grams per sq. cm.	Grams of chocolate extruded per min.
5	67.7	0.35
10	135.4	1.04
20	270.9	2.70
30	406.3	4.66
40	541.8	6.28
50	677.2	8.18
60	812.7	10.4
80	1,083.6	14.3
100	1,354.4	18.2

Digest from "Pseudoplastic Properties of Molten Chocolate," by L. E. Campbell, *Journal of the Society of Chemical Industry* **59**, 71, 1940 (Published in England).

DAIRY PRODUCTS

Removing Flavors From Cream

THE VACREATOR, a steam pasteurizer and flavor remover which is popular in the Australian dairy industry, has been compared with a Danish type tandem flash pasteurizer for treating tainted creams prior to churning. Butter made from clover-tainted cream, or cream with other feed taints, is much better after Vacreator treatment than after tandem

flash pasteurization, but the taint is not totally removed. The same is true of cream with bacterial flavors. Treatment of highgrade untainted cream in the Vacreator does not detract in any way from the quality of butter made from the cream. There is a tendency for drastic Vacreator treatment to remove all flavors, so that a flat insipid butter is produced. In such a case the desirable natural flavor can be restored by adding starter to the treated cream.

Digest from "Removal of Undesirable Flavours From Cream Used for Butter Manufacture," by W. Riddett, J. W. Smith, E. Beatson and H. R. Whitehead, *Australian Milk and Dairy Products Journal* **7**, No. 9 43, 1940 (Published in Australia).

Better Salting of Blue Cheese

IN THE MANUFACTURE of blue cheese, the usual procedure is to salt the cheese fresh from the hoops either by floating in brine or by rubbing on dry salt. It was found that mixing salt with the curd to the extent of 2 percent of curd weight at the same time that the mold powder was added was advantageous. The cheeses were dry-salted afterwards as usual. This method often gives better mold growth and usually gives lighter color and better flavor. Using more than 2 percent of salt delayed mold development and prevented the curd particles from matting normally.

Digest from "Effect of Salting Curd for Blue Cheese," by C. B. Lane and B. W. Hammer, *Journal of Dairy Science* **23**, 169, 1940.

MEATS

Effects of Temperature On Color in Canadian Bacon

EFFECTS OF TEMPERATURE on color and color stability of Canadian Wiltshire bacon were tested by exposing samples for periods of 5, 10, 20 and 40 hours to temperatures of 68, 104, 122, 140, 158 and 176 deg. F. Color intensity was measured when heating was stopped, and again after cooling at 50 deg. F. in moist air (95 percent relative humidity) for periods of 12, 20 and 96 hours.

Maximum average color intensity was observed in samples heated at 168 deg. F., while prolonged heating at 176 deg. F. made the color paler. Exposure to cold damp air for 12 hours after the heat treatment gave a decrease in color intensity depending on the length rather than the temperature of the preceding heat treatment. After 96 hours in the cold damp atmosphere, the fading in the green component still depended on length of heat treatment, but temperature influence was apparent in the red and blue color components. Color was apparently paler the higher the nitrite content of the meat, but was retained better than the more intense color associated with lower nitrite content. Weight loss (counted as moisture loss but including such losses as absorption of melted fat by paper wrappers) evidently increase color stability. Factory cured sides of bacon were used in making the tests.

Digest from "Canadian Wiltshire Bacon, XII. Effect of Heat Treatment on the Colour and Colour Stability of Bacon," by C. A. Winkler and J. W. Hopkins, *Canadian Journal of Research* **18D**, 289, 1940; reprinted by the National Research Council of Canada as NRC No. 932.

FATS & OILS

Queer Behavior Of Antioxidants

AUTOXIDATION, as a cause of rancidity in edible oils, can be accurately measured and is amenable to control. It is complicated by other causes, such as bacterial action and catalytic effects of light.

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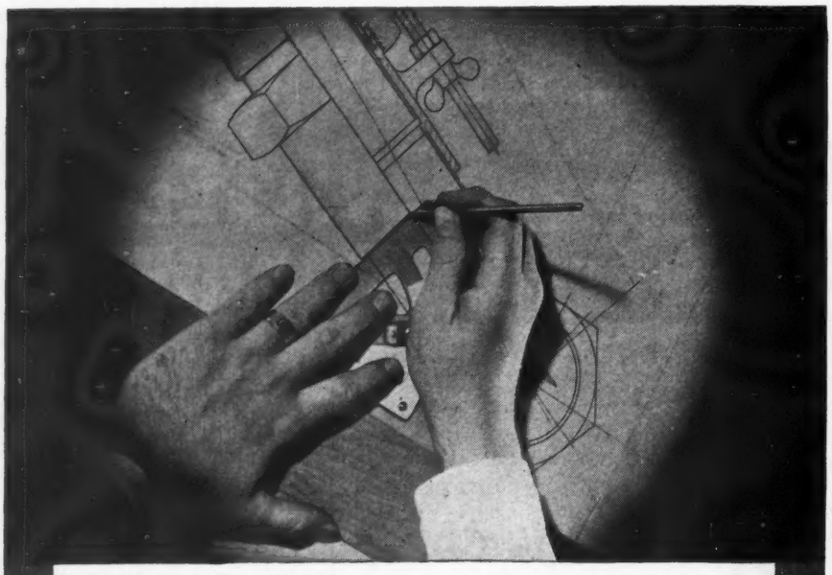
observed that exposure to light does not impair keeping quality if the oil is well protected from air (oxygen). Deterioration is more pronounced and more variable in open bottles (where air has free access to the contents) than in sealed half-filled bottles (limited air supply).

Use of antioxidants to prevent rancidity is effective if properly carried out, but careful attention is required because an agent may be proöxygenic at one concentration and antioxygenic at another, or it may be proöxygenic in one oil and antioxygenic in another. Thus oat flakes are proöxygenic in sunflower seed oil although in most other edible oils they effectively prevent oxidative rancidity. Again, Septasin (p-benzylaminobenzenesulfonamide) is successfully used as an antioxidant in some oils but is faintly proöxygenic in sunflower seed oil. For each case the effective concentration of a known antioxidant should be determined by trial.

Digest from "Autoxidation of Sunflower seed Oil," by C. G. Macarovici, *Bulletin de la section scientifique, academie roumaine* 22, 496, 1940 (Published in Koumania).



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PICKLES

Dill Pickle Fermentation

VINEGAR, added at the beginning of dill pickle fermentation, retarded acid formation but not disappearance of sugar. It did not change the ultimate amount of acid produced.

Lactic acid had a similar effect on acid formation and sugar fermentation, but cause a large percentage of bloaters to be formed. If lactic acid was not added until ten days after fermentation started, there was only a moderate production of bloaters.

Acid-forming bacteria predominate, but peptonizing bacteria were also present to a slight extent. Yeast fermentation was found in all cases. This factor in dill pickle fermentation has been generally unrecognized. It occurs after acid fermentation reaches a definite activity. Added sugar increased the acid-forming bacterial population, but not the final production of acid. It also increased the yeast count.

Added vinegar lowered the acid-forming bacteria count and permitted yeast fermentation to start sooner. Lactic acid favored yeast fermentation even more. Sugar, lactic acid and high brine strength all increase the percentage of bloaters.

Digest from "Chemical and Bacteriological Changes in Dill Pickle Brines During Fermentation," by I. D. Jones, M. K. Veldhuis, J. L. Etchells and O. Veerhoff, *Food Research* 5, 533, 1940.

SUGAR

Manganous Sulphate for Sugar Boiling

MINUTE QUANTITIES (exact proportions not stated) of manganese salts promote the crystallization of sugar from its boiling solutions and improve the quality of the crystals.

The preferred manganese compound is manganous sulphate. Comparative tests in which boiling time, sugar yield and amount of false grain were observed showed that manganous sulphate enables the solution to yield more sugar in a shorter boiling time, with scarcely any formation of false grain.

The sugar crystals formed in the presence of manganous sulphate are well formed, colorless, transparent and free from bubbles or cracks.

Digest from "Influence of Manganese Salt on Crystallization of Sucrose" and "Sugar Boiling in Presence of Minute Quantities of Manganous Sulphate," by Kakuo Suzuki, *Journal of the Society of Chemical Industry, Japan* 43, 234B, 235B, 1940 (Published in Japan).

Books

Pumps for Food Plants

PUMPS. By Frank A. Kristal and F. A. Annett. Published by McGraw-Hill Publishing Co., 330 W. 42d St., New York, N. Y. 1940. 340 pages; 6⅜x9¼ in.; cloth. Price, $3.50.

Although primarily a description of designs of pumping equipment available for general pumping service, this book also briefly discusses some of the more important pumps designed for food plant service. Most of its pages, however, are devoted to simple, clear explanations of pumps suitable for handling water, oil and other non-corrosive, non-abrasive, or slightly corrosive or abrasive liquids. This fact makes the work a valuable addition to the food engineer's library, as most other texts on pumping for the process industries have stressed special problems, rather than general pumping practice.

In addition to the pump descriptions, about one-third of the pages deal with such matters as priming, pipe sizes, head, operation, drives, pump selection, pump troubles and other practical matters for the plant operator.

Advice to Wine Makers

COMMERCIAL PRODUCTION OF TABLE WINES. By M. A. Amerine and M. A. Joslyn. Bulletin 639, published by University of California, Berkeley, Calif. 1940. 143 pages; 6x9¼ in.; paper.

Methods are given for producing, in California, both ordinary and fine table wines (those containing not over 14 percent alcohol). The methods are for still wines produced by natural fermentation (partial or complete) and champagne and other types of sparkling wines.

In introducing their material, the authors speak words of wisdom that should be heard throughout the wine industry of California: "The unusually favorable soil and climate of California offer great opportunities for the profitable development of characteristic native wines, though only a few such types have been produced thus far. The industry in general has neglected the opportunities in this field and has catered to the trade demands for foreign wine types. The absence of sharply defined, well-understood, and well-enforced standards for foreign types, whether produced here or abroad, has resulted in confusing arrays of widely differing wines under the existing type labels. Standardization of wine types is necessary since at present there is too great a variation in both composition and flavor of the same type as produced in different wineries. With the hope of promoting such standardization, suggestions on the preferred usage of various common type labels have been made in this bulletin."

The authors discuss the principles of wine making in some detail, since they consider a thorough understanding of them essential to the wine maker who wishes to improve present methods or create distinctive California types. Still further details, on both principles and practice, may be found in references listed by subject at the back of the bulletin.

Manufacture of Yeast

THE MANUFACTURE OF COMPRESSED YEAST. By F. G. Walter. Published by Chemical Publishing Co., Inc., 148 Lafayette St., New York, N. Y. 1940. 254 pages; 6x9 in.; cloth. Price, $6.

This book is particularly welcome among food technologists and engineers because it covers a subject about which little previously has been written. The author, an Englishman, describes the various processes applied in yeast culture. He explains the guiding principles of each process and cites examples to show how these principles are applied in practice. Raw materials and their treatment are covered, and the plant is described, with specifications of the more important units and an outline of the most suitable layout of the equipment.

The eight chapters are: The Yeasts, Isolation of Pure Yeast Cultures, Mashing and the Filtration and Division of Wort, Differential Fermentation of a Grain Brew, Compressed Yeast Production from Molasses and Inorganic Nitrogen, Yeast Production from Spirit Fermentations, Dried Yeast and Yeast Foods, and the Yeast Factory.

Packaging Symposiums

THREE BULLETINS, Production Series Nos. 120 and 121 and Marketing Series No. 38. Published by American Management Association, 330 West 42d St., New York, N. Y. 1940. 28 to 52 pages; 6x9 in.; paper. Price: No. 38, 50 cents; others, 75 cents.

These bulletins are symposiums on "Pitfalls in Package Production" (No. 120); "New Progress in Packing and Shipping" (No. 121); and "Planning the Package" (38). Slanted to the needs of managers and supervisors, the bulletins contain practical information and suggestions in concise form. They are particularly useful in guiding the thinking and practices of management and in keeping managers posted on what's new. A half dozen or more experts in various phases of packaging contribute to each of the symposiums.

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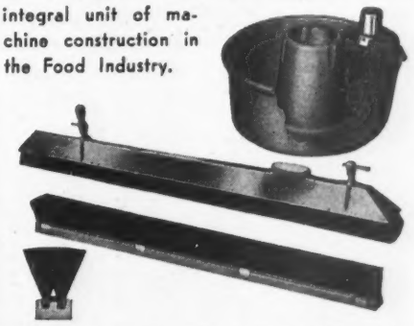

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Vegetable Oils Freed From Impurities by Two-stage Centrifuge Treatment Following a Preliminary Water Wash — George J. Strezynski, Poughkeepsie, N. Y., to De Laval Separator Co., New York, N. Y. No. 2,215,624. Sept. 24, 1940.

Citrus Fruit Waste Treated With Non-toxic Alkalies to Form Temporary Gel Preliminary to Separating Pulpy Solids From Mother Liquor by Breaking of Gel With Acid Treatment as an Intermediate Step—Daniel Boscawen Vincent, Winter Haven, Fla. No. 2,215,944. Sept. 24, 1940.

Dough for Bakery Products Given a Remixing in the Absence of Oxygen Following Fermentation Period and Subsequently Molded, Proofed and Baked—Jacob Freilich, New York, N. Y., and Charles N. Frey, Scarsdale, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,215,957. Sept. 24, 1940.

Packaged Frozen Foods Given a Water Glaze Preparatory to Stenciling for Identification by Spraying a Colored Liquid Upwardly Against Stencil Applied to Glazed Surface—Robert P. McNaught, San Francisco, Calif. No. 2,216,127. Oct. 1, 1940.

Bakery Doughs Bleached to Increased Whiteness by the Addition of Crystalline Carotin-decolorizing Agent Obtained From a Legume by Extraction With Water Containing Ammonium or Magnesium Sulphate—John D. Guthrie, Yonkers, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,216,173. Oct. 1, 1940.

Carotin-decolorizing Agent Obtained From a Legume by Treatment With a Solvent, Treating Resultant Liquid With Acetone to Precipitate Active Material Which is Finally Separated and Dried at Low Temperature—John D. Guthrie, Yonkers, N. Y., to Standard Brands, Inc., New York, N. Y. No. 2,216,174. Oct. 1, 1940.

Starches Pregelatinized by Adding From 15 to 60 Percent Water and Steaming at Atmospheric Pressure to Burst Starch Cells Prior to Grinding While Still in Wet State—Hans F. Bauer, to Stein Hall Mfg. Co., Chicago, Ill. No. 2,216,179. Oct. 1, 1940.

Masses of Frozen Meat Slit Into Slices by Mechanical Means—Joseph P. Spang, Quincy, Mass., to Cube Steak Machine Co., Inc., Boston, Mass. No. 2,216,216. Oct. 1, 1940.

Fruit Juices Sterilized by Separating Color-containing Portions From Water Portions Preliminary to Sterilizing the Color Fraction With Chlorine in the Cold and the Liquid Fraction by Heat Application Followed by Blending of the Sterilized Fraction — Gotthold Harry Meinzer, Glendale, Calif., to California Consumers Corp., Los Angeles, Calif. No. 2,216,295. Oct. 1, 1940.

Edible Fluid Mixture Separated Into Liquid and Solid Components by Horizontal Hydraulic Press Action—Alonzo Linton Bausman, to National Equipment Co., Springfield, Mass. No. 2,216,484. Oct. 1, 1940.

Oil Expelled from Protein-containing Materials Without Injurious Rise in Temperature by Circulating Pre-cooled Fluid Directly Over and in Intimate Contact With Pressure-exerting Surfaces — Raymond T. Anderson, Berea, Ohio, to V. D. Anderson Co., Cleveland, Ohio. No. 2,216,658. Oct. 1, 1940.

Fat Bloom on Surface of Chocolate and Chocolate Coated Confections Retarded by Treating Portion of Cocoa Butter Content During Tempering Treatment With an Oxide of Nitrogen or Sulphur Dioxide, to Raise Melting Point of Cocoa Butter Surface Layer—Leon Russell Cook and John Harding Light, to Wilbur-Suchard Chocolate Co., Inc., Lititz, Pa. No. 2,216,660. Oct. 1, 1940.

Alkali-refined Vegetable and Animal Oils Freed From Residual Impurities by Mixing With a Continuous Flow of Water in Enclosed Mixing Zone Without Mechanical Agitation and Finally Separating the Oil—Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev. No. 2,216,680. Oct. 1, 1940.

Sugar Solutions Decolorized by Treatment With a Soluble Phosphate and a Hypochlorite—Pedro Sanchez, Havana, Cuba, and Eugene N. Ehrhart, New York, N. Y., to Sucro-Blanc, Inc., New York, N. Y. No. 2,216,753. Oct. 8, 1940.

Sugar Solutions Freed From Finely Divided Carbon Without Filtering by the Formation of a Removable Scum — Pedro Sanchez, Havana, Cuba, and Eugene N. Ehrhart, New York, N. Y., to Sucro-Blanc, Inc., New York, N. Y. No. 2,216,754. Oct. 8, 1940.

High-grade Crystalline Sugar Recovered From Refinery Sirup Resulting From Sugar Solutions Initially Decolorized by Hypochlorite—Pedro Sanchez, Havana, Cuba. No. 2,216,755. Oct. 8, 1940.

Citrus Fruit Juices Stabilized by Heating to a Temperature Dependent Upon Acidity Content and For a Time Dependent Upon Contents of Insoluble Solids — Jesse W. Stevens, Ontario, Calif. No. 2,217,261. Oct. 8, 1940.

Protein Material Converted to Amino Acid by Splitting Action of Proteolytic Enzymes Followed by Further Degradation Through the Action of Autolyzed Yeast at Incubating Temperature — Charles Weizmann, London, England. No. 2,217,264. Oct. 8, 1940.

Smoking of Meat Improved by Use of Redwood Smoke — Harry F. Lewis, Appleton, Wis., to Pacific Lumber Co., San Francisco, Calif. No. 2,217,282. Oct. 8, 1940.

Candies in Cube Form Separated From Slab by a Continuous Acting Mechanical Means—Kebir Garnet McKillop, Vancouver, B. C., Canada. No. 2,217,285. Oct. 8, 1940.

Margarine Made to Contain a Partially Hydrated Hydrophilic Colloid—Albert K. Epstein and Benjamin R. Harris, Chicago, Ill., and Marvin C. Reynolds, deceased, by Lulu E. Reynolds, Hinsdale, Ill., and The First National Bank of Chicago, Ill. No. 2,217,309. Oct. 8, 1940.

Bread Baked in a Traveling-tray Oven Having Lowest Flight of Travel on a Level With the Baking Chamber Opening and the Topmost Flight of Travel Near Top of Baking Chamber—Charles Gottfried, New York, N. Y. No. 2,217,312. Oct. 8, 1940.

Marshmallow Made by a Continuous Method in a Machine Designed to Exert Centrifugal Force—Frank S. Nanna, Chicago, Ill. No. 2,217,318. Oct. 8, 1940.

Chocolate Cast Into Cake Form, Packaged and Then Perforated to Make Cakes Easily Separable Into a Plurality of Portions Without Greatly Weakening the Package—John D. Warfield, Jr., to Warfield Co., Chicago, Ill. No. 2,217,392. Oct. 8, 1940.

Raw Cane Sugar Freed From Impurities by Being Stirred Into Concentrated Cane Juice, Heating to Increase Fluidity of Mass and to Loosen Adherent Substances and Then Centrifuging for Separation of the Liquids From the Solid White Sugar Constituents—Eugene Roberts, Hastings, N. Y., and George E. Stevens, Denver, Colo., to the Western States Machine Co., New York, N. Y. No. 2,217,598. Oct. 8, 1940.

Beet Sugar Made By a Three-massecuite Process—George E. Stevens, Denver, Colo., to Western States Machine Co., New York, N. Y. No. 2,217,603. Oct. 8, 1940.

Cane Sugar Made By a Three-massecuite Process—George E. Stevens, Denver, Colo., to Western States Machine Co., New York, N. Y. No. 2,217,604. Oct. 8, 1040.

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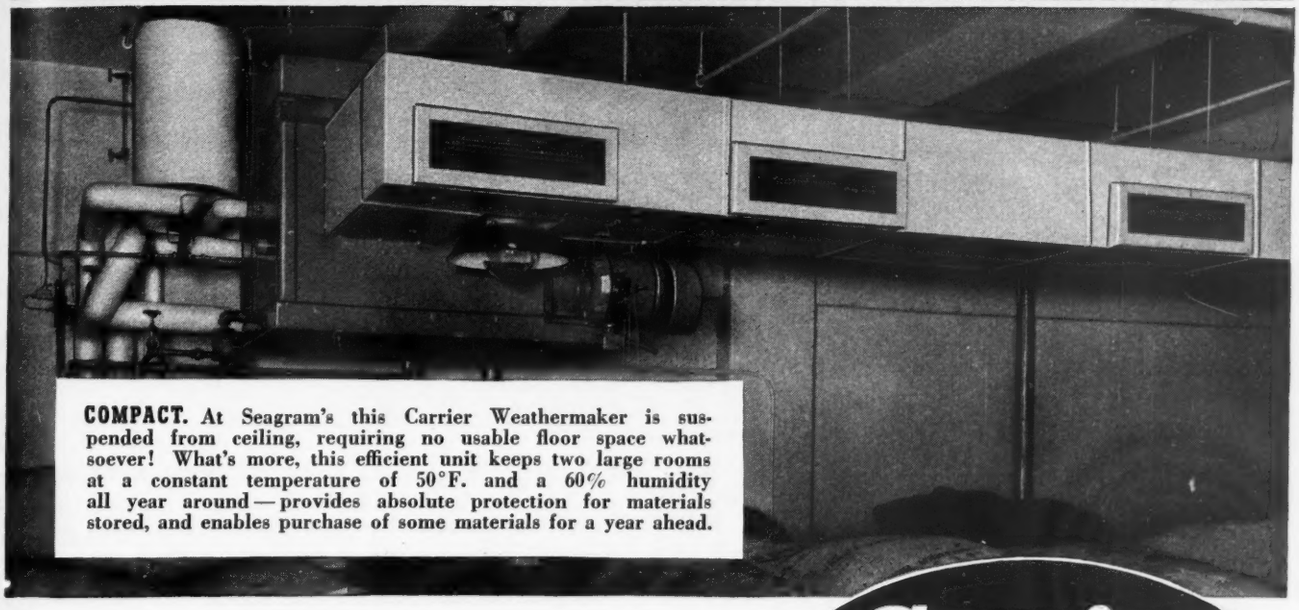

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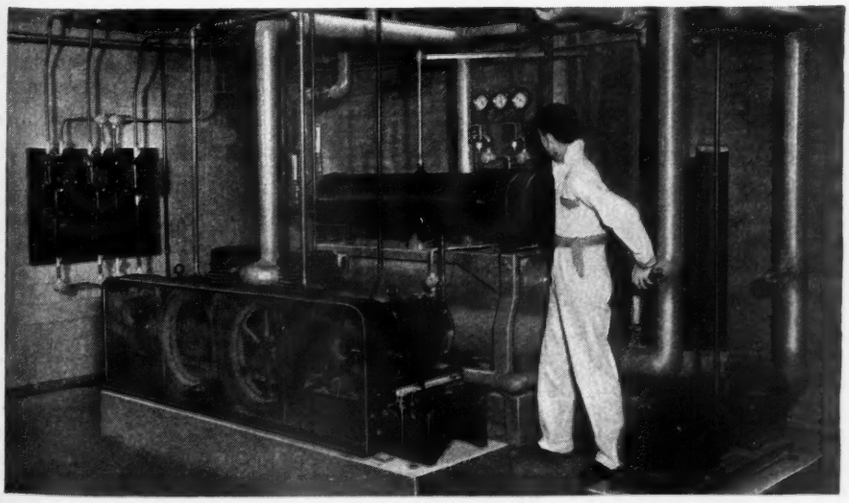

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Briefly, these are the facts about mineralization. Nutritional experts have long since maintained that (1) calcium and phosphorous are essential to good health, and (2) that the average American diet is often deficient in these minerals. Both of these facts have been well publicized. As a direct result pharmaceutical manufacturers have found ready acceptance for tablets of calcium phosphate.

Several far-sighted food-product manufacturers . . . among them the makers of popular breakfast cereals, flour, and bread . . . have recognized and taken advantage of the unique opportunity thus presented. Why not correct mineral deficiency, they have logically reasoned, by enriching staple foods that people are accustomed to eat . . . rather than attempt to develop new tastes and habits?

Mineralization in no way complicates the problem of production. The cost, too, is negligible. As world's largest manufacturers of food grade calcium phosphates, the Victor Chemical Works has played an important part in making these vital minerals . . . calcium and phosphorus . . . readily and economically available.

Our research laboratory, in advancing the cause of food fortification, has acquired considerable practical experience. You will find our staff of experts well qualified and anxious to serve . . . particularly when it comes to technical information on processing and similar problems.

Today, mineralization is the exception. Tomorrow it will be the rule. Will *you* be the first in *your* field?

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HEADQUARTERS FOR MINERAL SUPPLEMENTS

Formulas for Foods

FORMULA NO. 144

Danish Pastry Dough

Sugar (sucrose)	10 oz.
All-purpose vegetable shortening	8 oz.
Salt	1½ oz.
Vanilla extract	⅛ oz.
Grated lemon rind from	1 lemon

Cream for 3 minutes on low speed.

Whole eggs	1 lb.

Add eggs during 5 minutes creaming (low speed).

Liquid milk at 80 deg. F.	2 lb.
Yeast	8 oz.

Dissolve yeast in milk. Add, and give 5 revolutions.

Bread flour	4 lb. 8 oz.

Stir in flour, and mix until dough begins to pull from side of bowl. Allow to rest in a cool place for 30 minutes.

Roll-in mixture	2 lb.

Roll-In Mixture Formula

Butter, full flavored	2 lb. 8 oz.

Mix until smooth and free from lumps.

Powdered skim milk	5 oz.

Add and rub in with butter.

All-purpose vegetable shortening	7 lb. 8 oz.

Mix in slowly, adding a little at a time. Milk powder may be increased if desired. This mixture is enough for five of the main batches. Keep unused portion in refrigerator for future use.

Working Directions

1. On lightly flour-dusted bench, roll dough into oblong shape until ½ in. thick. "Spot" the roll-in mixture over two-thirds of the dough. Leave one-third uncovered. Spotting insures even distribution of the shortening. If mixture is quite firm, flatten lumps slightly with the hand.

2. Fold the uncovered portion over the middle third. Brush off all dusting flour.

3. Then fold the other third portion onto the other, thus giving 5 alternate layers of dough and roll-in mixture.

4. Roll the foregoing out to ½ in. thickness. Brush off all dusting flour.

5. Fold again as in 2 and 3. This is known as a three-fold roll.

Two more three-fold rolls must be given. But, between rollings, let the dough relax thoroughly in an ice box or other cool place for 20 to 30 minutes on a lightly flour-dusted board, covered with a clean cloth.

At the end of the second three-fold roll there will be 45 layers and at the end of the third three-fold roll there will be 135 alternate layers of dough and roll-in mixture.

Scaling weight: Average 2 oz. (variable according to the size of the piece). Allow dough to rest 15 minutes before making up into Pecan Crispies, Elephant Ears, Butterflies, Butter Horns, Raisin Ovals, Schnecken, Triangles, Crescent Rolls, Palm Leaves, etc.

Formula adjusted for use with "Covo" as the all-purpose vegetable shortening.

Formula from Lever Brothers Co.

FORMULA NO. 145

Halibut "Cheeks" Canned in Jelly

Preparation

Cut the "cheeks" from selected halibut heads. Do not use heads that have been gaffed, bruised or clubbed. (Coagulated blood spoils appearance and flavor.) Skin the cheeks.

Brine the skinned cheeks for 10 minutes in 60-deg. sal. brine (15 percent salt by weight).

Spread the brined cheeks in a single layer on ½-in. mesh galvanized wire trays. Stack the trays in a retort.

Precook the halibut cheeks 10 minutes at 215 deg. F. This results in a loss of 24 to 28 percent. Remove from retort and cool.

Packing

Pack the precooked cheeks into ½-lb. flat enameled cans. Add to each can 1 oz. of jelly solution which is hot enough to run through the flesh. The jelly solution is:

Agar agar	3 percent
Animal gelatin	8 percent
Water	89 percent

The agar is used to keep the jelly firm at 70 deg. F., but the animal gelatine gives a better flavor.

Processing

Single seam (clinch) the cans. Exhaust them 10 minutes at 210 to 212 deg. F. Double seam the cans. Process for 80 minutes at 240 deg. F. Cool under pressure.

Formula from P. A. Sunderland, Pacific Fisheries Experimental Station, Prince Rupert, B. C. Progress Reports No. 45.

FORMULA NO. 146

Sweet Orange Fingers

This is a confection with an exquisite flavor which may be nibbled with plain soda water or a liquor.

Take the peel from 5 boxes of oranges and cut lengthways into ¼-in. strips. (The fruit itself is used for crushed oranges, orange juice or some other purpose.)

Place the strips in cold water. Simmer gently until quite tender. Drain off water.

Immerse strips in cold sirup made from glucose and water to 20 deg. Baumé. Let stand overnight.

Next day bring the foregoing to a boil in a steam-jacketed kettle. Transfer to another container and allow to stand overnight.

Return to steam kettle. Add 2 gal. of glucose. Bring to boiling point. Remove the batch and allow to stand overnight.

On the next day return batch to the kettle. Add 2 gal. of a sirup consisting of equal parts of glucose and sugar (sucrose) having a density of 30 deg. Bé. Bring to a boil. Remove and let stand overnight.

On the following day place the batch back in the kettle. Simmer gently until thermometer reads 229 deg. F. Transfer to another container and allow to stand for 10 to 15 minutes. Then rub one place on the inside of the pan until the sirup turns white (i.e., until incipient crystallization sets in).

Transfer the cream to wire mesh trays and place in a dry room until cold.

Wrap the fingers in transparent wrappers and pack in cartons of about 7-lb. capacity.

Formula from H. B. Cronshaw, London, England. Republication rights reserved.

FORMULA NO. 147

Chocolate Caramels

Sweetened condensed whey	3,280 grams or oz.

If You Use Starch—

You'll Find

MELOJEL

Worth Investigating!

- **MELOJEL** is a new, improved processed Corn Starch with many distinctive and outstanding properties never before obtainable in Corn Starch.
- **MELOJEL** offers controlled "jell," with exceptional stability; unvarying uniformity; unusual smoothness; and improved flavor, for **MELOJEL** is remarkably free from cereal taste.
- **MELOJEL** is unsurpassed for Pie Fillings and Dessert Preparations; as a bodying agent for Salad Dressings; for use in Soups, Gravies, Ice Cream Cones, or any food product in which starches are used.

FREE WORKING SAMPLE:

We shall be glad to send you a generous free working sample, or a trial 100-lb. bag on approval, if you will give us the full facts regarding the type of product in which you want to use it. With the facilities of our Laboratory and Food Kitchen, we are equipped to give you valuable information for using **MELOJEL** to your best advantage.

NATIONAL STARCH PRODUCTS INC.

818 GREENWICH STREET, NEW YORK

Whey solids 40 percent	
Sugar 40 percent	
Condensed skim milk (30 percent milk solids)	800 grams or oz.
Corn sirup (80 percent)	1,480 grams or oz.
Invert sirup (80 percent)	395 grams or oz.
Coconut fat (m. p., 110 deg. F.)	295 grams or oz.
Chocolate	345 grams or oz.
Total	6,795 grams or oz.

Working Directions

Cook caramel ingredients with stirring to a firm ball or approximately 246 deg. F. Pour on a stone slab.

Formula from B. H. Webb and C. F. Hufnagel, Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C.

FORMULA NO. 148

Chocolate Icing

Cream icing stock (Formula 132)	5 lb.
Cocoa	5 oz.
Vanilla extract	to suit

Cream well.

Formula from American Dry Milk Institute, Inc.

FORMULA NO. 149

Cherry Icing

Flour	2½ oz.
Cream icing stock (Formula 132)	5 lb.
Cherries (chopped)	1½ oz.
Color (if desired)	to suit

Cream well.

Formula from American Dry Milk Institute, Inc.

FORMULA NO. 150

Peanut Brittle No. 3

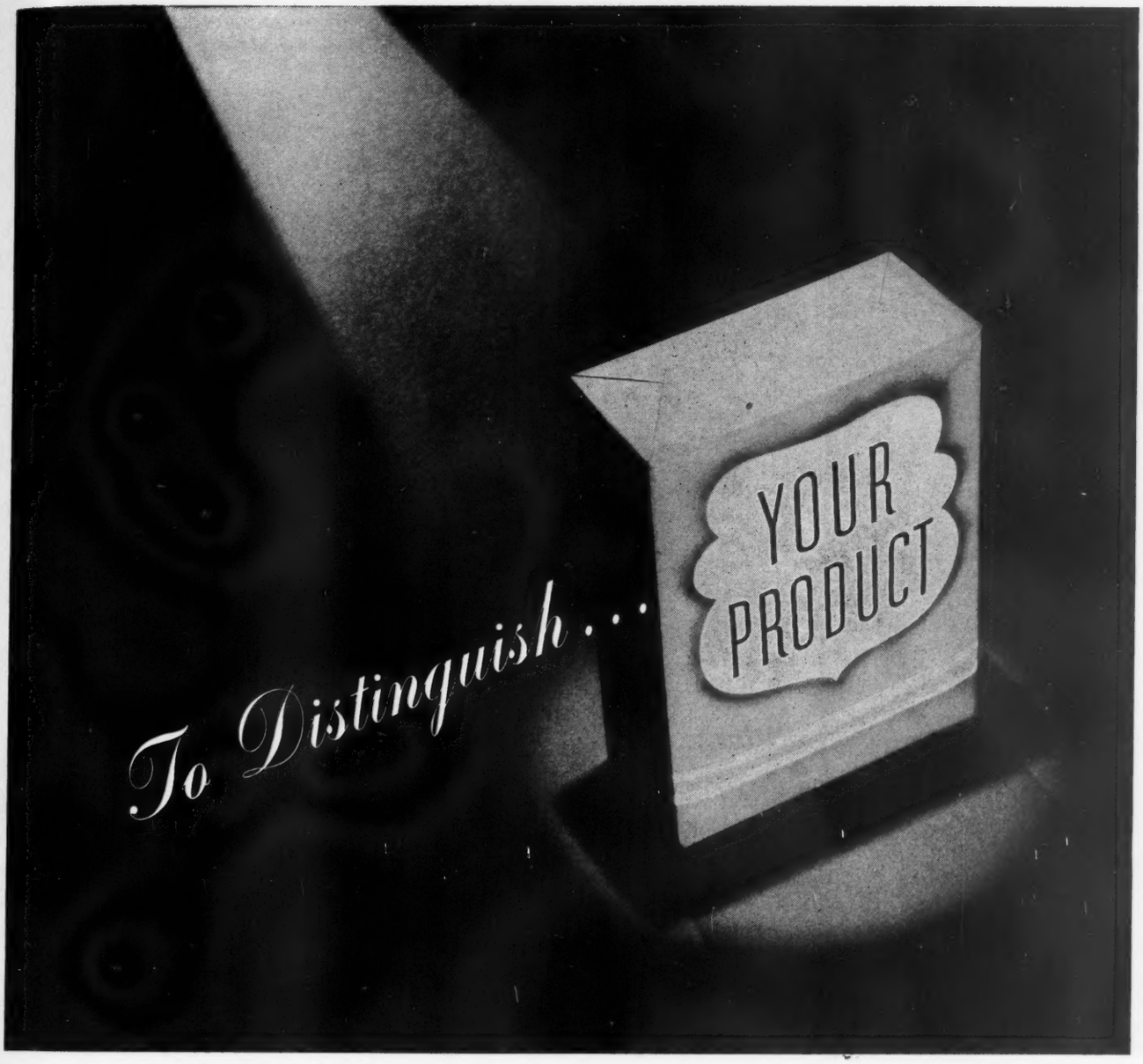
Sugar (white granulated)	10 lb.
Water	1 qt.
Corn sirup	10 lb.
No. 1 Spanish peanuts (raw)	15 lb.
Molasses (yellow)	1 qt.
Salt	2 tablespoonfuls
Oil of lemon	1 tablespoonful
Soda (optional)	1 teaspoonful

Cook sugar, water and corn sirup in open fire pan with frequent stirring to 230 deg. F.

Stir in peanuts and continue cook until they are well roasted. Then add molasses gradually and with stirring.

Cook to 240 deg. F.; add salt; stir well; and pour out on oiled cooling slab.

Allow to cool for a few minutes. Add



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Vitamin B_1 Crystals Merck are ideally adapted to incorporation in a variety of food products. By using this pure crystalline substance, problems of odor, taste, color, and bulkiness are completely eliminated.

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THREE TOPS IN QUALITY

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The genuine Arrowroot (Maranta Arundinacea) finely powdered—most easily digested of all starches—the starch that is most impervious to the action of acid.

2 AROOSTOOCRAT POTATO STARCH

First domestic made product that is equal to the finest imported potato starch—high viscosity — clean and uniform — a pure food starch in every sense of the word.

3 CIRCLE STAR XXX TAPIOCA FLOUR

A product of one of the outstanding mills of the Dutch East Indies—a good product long accepted as top quality by the food industries. Ample stocks on hand for early delivery.

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MORNINGSTAR, NICOL, INC.
Established 1851
630 West 51st St. New York, N. Y.
1770 Canalport Ave. Chicago, Ill.

oil of lemon; fold in edges; and work to keep nuts uniformily distributed while mass stiffens.

Then roll and stretch to form into thin sheet.

When thoroughly cold, break up and pack.

If soda is added, be careful to stir in quickly and well before pouring mass onto slab. Otherwise batch may boil over.

FORMULA NO. 151

Cane and Maple Sirup Blends

The following quantities make 100 gal. of blended sirup.

Using Maple Sugar

15 Percent Maple Blend

Sugar (sucrose)	617 lb.
Maple sugar	116 lb.
Water	44 gal.

17½ Percent Maple Blend

Sugar (sucrose)	600 lb.
Maple sugar	135 lb.
Water	44 gal.

20 Percent Maple Blend

Sugar (sucrose)	580 lb.
Maple sugar	155 lb.
Water	44 gal.

25 Percent Maple Blend

Sugar (sucrose)	545 lb.
Maple sugar	193 lb.
Water	44 gal.

These proportions are based on the assumption that the moisture content of the maple sugar is 6 percent.

Working Directions

Grind or break up the maple sugar into small pieces. Put the maple and sucrose sugars in a kettle with the water. Heat and stir until all the sugar is completely dissolved. Bring to a boil (219 deg. F.) and test the density with a Baumé hydrometer. At 219 deg. F. the sirup should test 31.5 deg. Bé. If Baumé reading is higher add more water, if lower, continue boiling until proper density is reached. This will make the density of the sirup when cold (60 deg. F.) about 35.5 deg. Bé. At 60 deg. F. the sirup should not be heavier than 36 deg. Bé. in order to avoid crystallization.

The sirup should be filtered while still hot. If no filter press or other filtering equipment is available, place the hot sirup in a settling tank equipped with a draw-off about six inches from the bottom and allow to stand for two or three days. This will permit any sediment to settle at the bottom of the tank. The clarified sirup can then be removed through the draw-off for packing. It should be packed and sealed in airtight containers at a temperature of 170 deg. to 180 deg. F. Allow ¾ fluid